

AMERICAN JOURNAL OF OPHTHALMOLOGY

THIRD SERIES FOUNDED BY EDWARD JACKSON

CONTENTS

Tonographic effects of echothiophate	<i>Bernard Becker, Gilbert C. Pyle and Robert C. Drews</i>	635
Glaucoma control	<i>Malachi W. Sloan, II</i>	641
Value of electroretinography	<i>Alex E. Krill and Gilbert Iser</i>	649
Modification of facility of outflow ..	<i>Carlton E. Melton and David W. Hayes</i>	657
Fluorescing illumination	<i>Elliott B. Hague</i>	663
Surgery of inferior oblique	<i>George S. Zugsmith</i>	667
Boeck's sarcoid	<i>Thomas R. Hedges, Jr., and Osvaldo C. Cardoso de Melo</i>	673
Use of the Visuscope	<i>Marina P. Meyers</i>	677
Phacogenic glaucoma	<i>Budd Appleton and Austin Lowrey, Jr.</i>	682
Nevoxanthoendothelioma	<i>Charles C. Hedges, Jr.</i>	683
Occlusion of cilioretinal artery	<i>M. Wallace Friedman</i>	684
Cataract operation without assistant	<i>William H. Anderson, Jr.</i>	686
Tape for eye bandaging	<i>James E. Zullo</i>	687
Fluorescent test objects	<i>Winston Roberts and Robert P. Thomas</i>	688
Suturing forceps	<i>Ramón Castroviejo</i>	689
Gelatin film as seton	<i>Robert N. Lehman and Murray F. McCaslin</i>	690
Flexible retractor	<i>Tutomu Sato</i>	692
Monocular trial frame	<i>G. Peter Halberg</i>	692

DEPARTMENTS

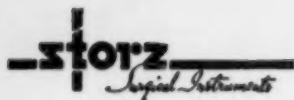
Editorial	694	Book Reviews	700
Correspondence	696	Abstracts	703
News Items	749		

For a complete table of contents see page xxxvii

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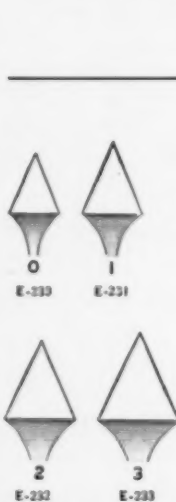
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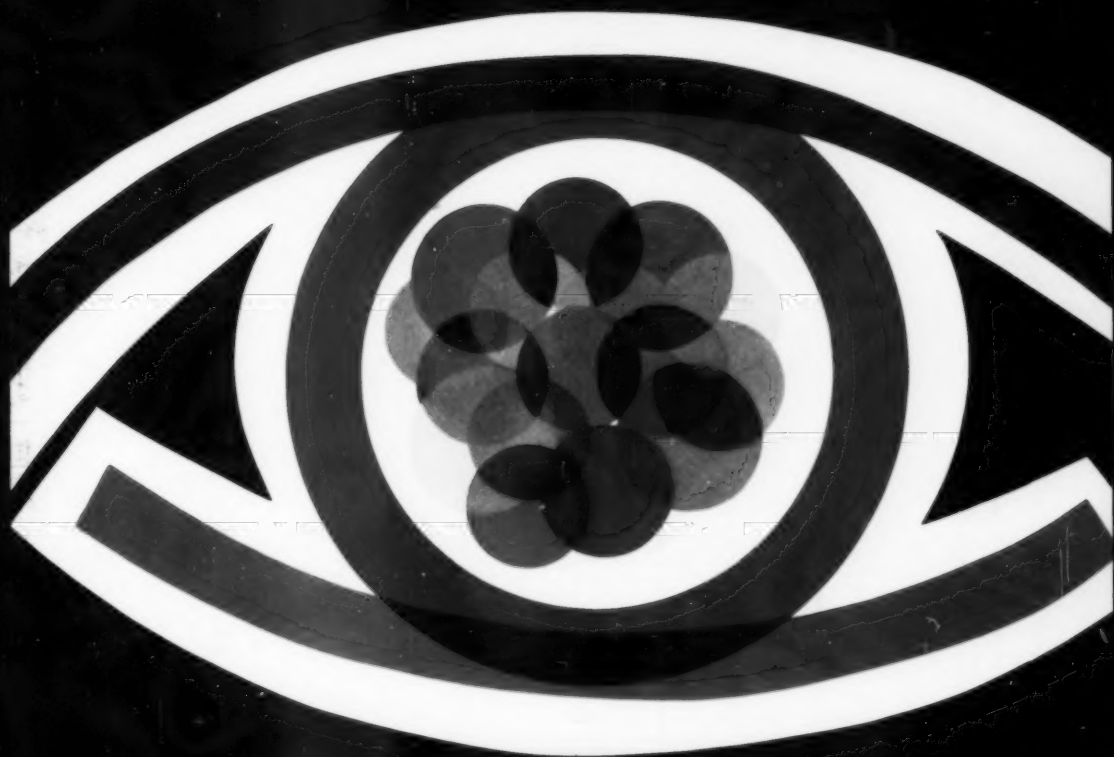
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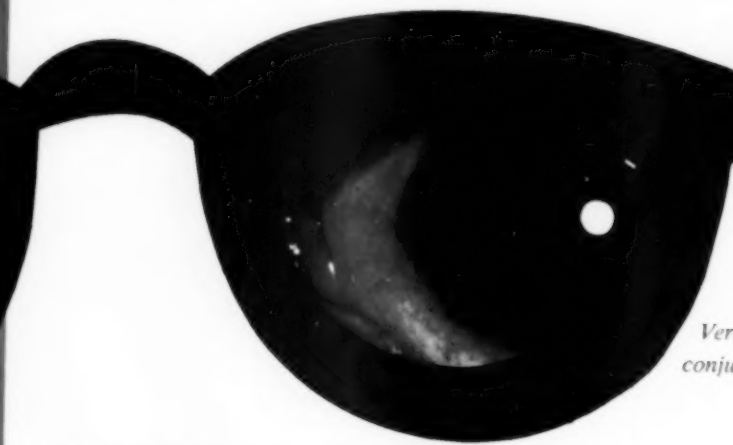
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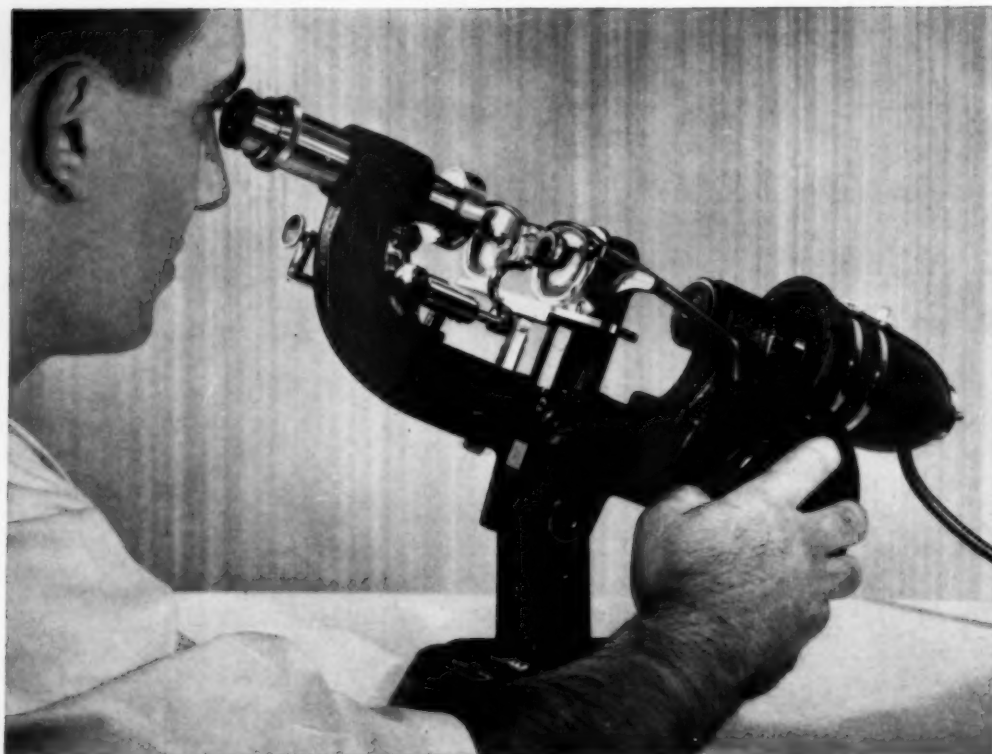
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HIGHLIGHTS FROM THE A.M.A. COUNCIL ON DRUGS

REPORT ON TRIAMCINOLONE

J.A.M.A. 169:257 (January 17) 1959.

"It [triamcinolone] has an anti-inflammatory potency greater than an equal amount of prednisolone; i.e., comparable suppressive effects may usually be achieved with lower doses of triamcinolone than with prednisolone."

"Triamcinolone lacks the sodium-retaining and edema-producing effects of most other glucocorticoids. During the first several days of administration, it may cause a loss of sodium from the body; an initial mild diuretic action is frequently observed, whether the patient is frankly edematous or not. This is in contrast to the definite sodium-retaining and fluid-retaining properties of cortisone and hydrocortisone and to a much lesser extent with prednisone and prednisolone."

"Except in exceedingly large doses, triamcinolone apparently has no consistent effect on potassium excretion. Hence, neither sodium restriction nor potassium supplementation is ordinarily required during therapy with this agent."

"As with other glucocorticoids, the long-term administration of triamcinolone results in definite catabolic effects, as indicated by impairment of carbohydrate utilization and negative protein and calcium balance. This catabolic effect, coupled with a lack of appetite stimulation which is apparently peculiar to triamcinolone, may produce weight loss that might be undesirable in some patients treated for long periods of time."

"...the voracious appetite, with weight gain and euphoria, characteristic of other steroids, is not seen with administration of triamcinolone."

"Triamcinolone has been used for the management of a wide variety of clinical conditions usually considered amenable to systemic steroid therapy. These have included rheumatoid arthritis and other collagen diseases, allergic and dermatological disorders, certain leukemias and malignant lymphomas, the nephrotic syndrome, pulmonary emphysema and fibrosis, acute bursitis, rheumatic fever, and certain blood dyscrasias. Although clinical experience with the drug in some of the foregoing conditions is not extensive, the many similarities in action between triamcinolone and other potent glucocorticoids would indicate a usefulness for triamcinolone akin to that of other agents of this class."

"There is some evidence that triamcinolone is more effective at a smaller dosage than are other steroids in controlling both the skin and joint lesions in psoriasis, whether or not complicated by arthropathy."

"Triamcinolone appears to compare favorably with other steroids for use in those situations in which edema and sodium retention have been complicating problems."

"It [triamcinolone] may also be the steroid of choice for patients in whom psychic stimulation, euphoria, voracious appetite, and weight gain should be avoided."

"...the drug [triamcinolone] does produce the other side effects and untoward reactions common to the glucocorticoids. At therapeutically equivalent doses, the frequency and severity of clinical manifestations of hyperadrenalism — rounding of the face, fat deposition, and hirsutism — are essentially the same. Likewise, there is little indication that the relative incidence of osteoporosis is materially decreased after the long-term use of the drug."

"Triamcinolone apparently does not cause the euphoria sometimes seen with other steroids, and the occurrence of mental depressions is uncommon."

"Current evidence suggests that the drug [triamcinolone] may not produce as high an incidence of peptic ulcer as do other steroids."

"Cutaneous erythema seems to be a side effect peculiar to triamcinolone."

"The usual contraindications and precautions of glucocorticoid therapy should be followed in the use of triamcinolone, keeping in mind that prolonged therapy with this drug will suppress the function of the patient's own adrenals by interfering with the pituitary-adrenal axis."

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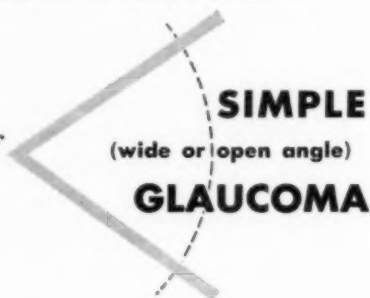
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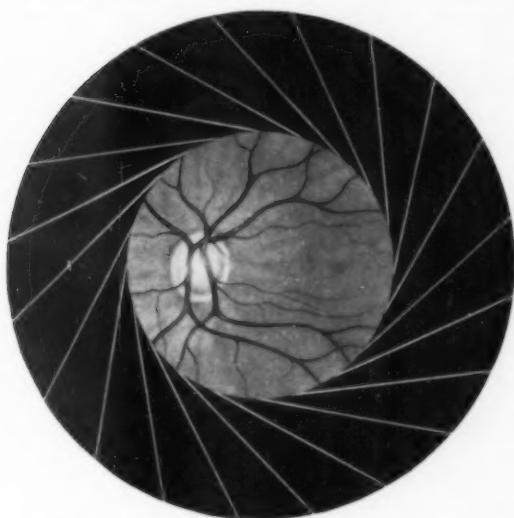
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1. GIFFORD S. R.; OCULAR THERAPEUTICS, 4TH ED., LEA & FEBIGER, PP. 253-256 • 2. HAMBURGER, C.; ZU DER NEUEN GLAUKOMBEHANDLUNG. KLIN. MONATSSBL. F. AUGENH., 72:47, 1924 • 3. DUKE-ELDER, W. S. AND LAW, F. W.; TREATMENT OF GLAUCOMA BY ADRENALINE AND HISTAMINE. BRIT. MED. JNL., 1:590, 1929



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1. Priestly, B. S.; Medicine, M. N., and Phillips, C. C. To be published. 2. Ahlquist, R. P. in Drill, V. A. Pharmacology in Medicine, McGraw-Hill Book Company, Inc. New York, 1954, p. 18-26.



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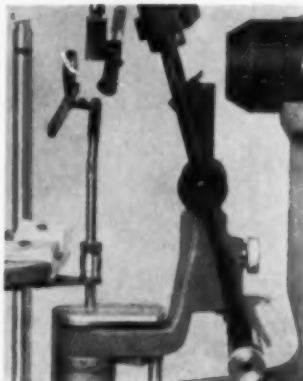
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REFERENCES: (1) Perkins, E. S.: *Practitioner* 178:278, 1947. (2) Quercus and Minor Notes, *J.A.M.A.* 181:1032, 1954. (3) Smith, C. H.: *Eye, Ear, Nose & Throat Month.* 34:589, 1955. (4) *Blackiston's New Gould Medical Dictionary*, ed. 2, New York, McGraw-Hill Book Company, Inc., 1954, p. 945. (5) Ostler, H. B., & Bailey, A. G.: *J. Iowa M. Soc.* 44:427, 1954.

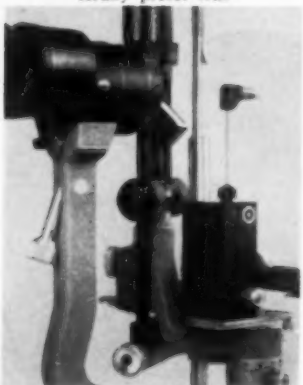


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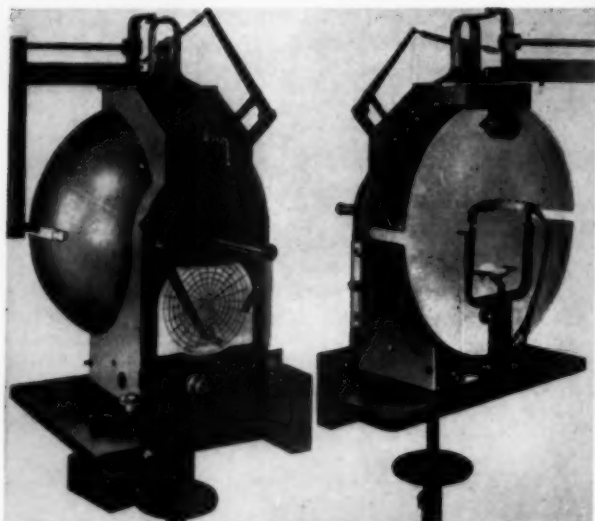
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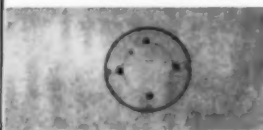
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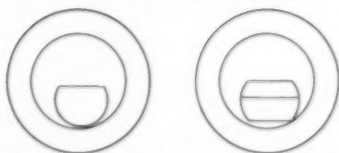
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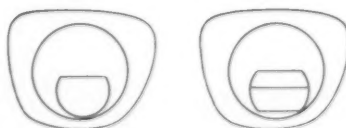
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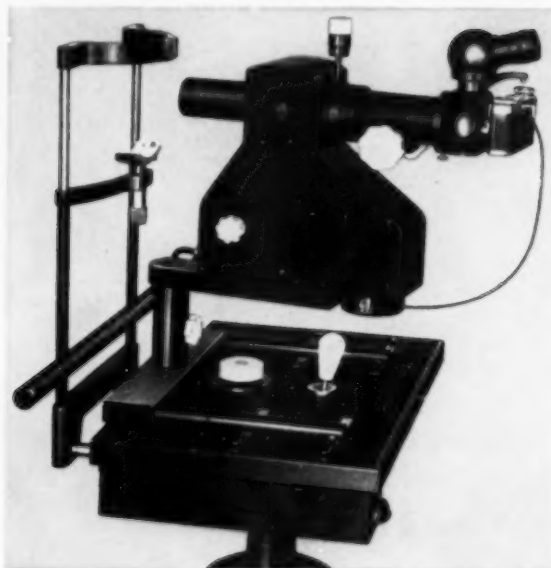
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1. *Cecil's Textbook of Medicine*, 7th ed., 1947, p. 1287.
2. *Ibid.*, p. 1598.
3. *Am. J. Ophth.* 42:771, 1956.
4. *Am. J. Digest. Dis.* 22:5, 1955.
5. *Med. Times* 84:741, 1956.

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SERIES 3 · VOLUME 47 · NUMBER 5, PART I · MAY, 1959

CONTENTS

ORIGINAL ARTICLES

- The tonographic effects of echothiophate (phospholine) iodide: Reversal by pyridine-2-aldoxime methiodide (P₂AM). Bernard Becker, Gilbert C. Pyle and Robert C. Drews 635
- Glaucoma control: Results of routine tonometry in 2,100 patients: A preliminary report. Malachi W. Sloan, II 641
- The value of electroretinography: In the diagnosis of pigmentary degenerations of the retina. Alex E. Krill and Gilbert Iser 649
- Modification of facility of outflow: By perfusion of the vitreous chamber in the enucleated cat eye. Carlton E. Melton and David W. Hayes 657
- Fluorescing illumination in cataract surgery. Elliott B. Hague 663
- A new approach to surgery of the inferior oblique muscle. George S. Zugsmith 667
- Corneal and auditory findings in Boeck's sarcoid. Thomas R. Hedges, Jr., and Osvaldo C. Cardoso de Melo 673
- The use of the Visuscope: For mapping a "field" of retinal function. Marina P. Meyers 677

NOTES, CASES, INSTRUMENTS

- Phacogenic glaucoma. Budd Appleton and Austin Lowrey, Jr. 682
- Nevoxanthoendothelioma: Of the eye treated with superficial X-ray therapy. Charles C. Hedges, Jr. 683
- Occlusion of the cilioretinal artery. M. Wallace Friedman 684
- Technique for cataract section and suture without a trained assistant. William H. Anderson, Jr. 686
- An improved tape for eye bandaging. James E. Zullo 687
- Fluorescent test objects: For pantoscopic tangent screen. Winston Roberts and Robert P. Thomas 688
- New suturing forceps for cornea and cataract work. Ramón Castroviejo 689
- Gelatin film used as a seton in glaucoma. Robert N. Lehman and Murray F. McCaslin 690
- Flexible retractor. Tutomu Sato 692
- Monocular trial frame. G. Peter Halberg 692

EDITORIAL

- Wilmer meeting 1959 694

CORRESPONDENCE

- Trabecula; trabeculum 696
- Hyphema and raised intraocular pressure 697

BOOK REVIEWS

- The Anatomy of the Nervous System: Its Development and Function 700
- La Tetanie Chronique ou Spasmophilie 700
- Itinerant Teaching Service for Blind Children 701
- Transactions of the American Ophthalmological Society, 1958 701
- Year Book of Ophthalmology (1958-59) 702

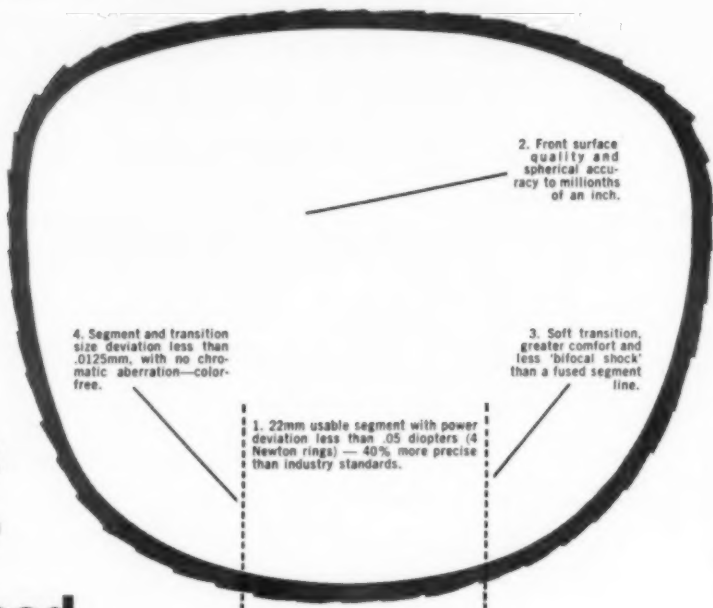
ABSTRACTS

- Vegetative physiology, biochemistry, pharmacology, toxicology; Physiologic optics, refraction, color vision; Diagnosis and therapy; Ocular motility; Conjunctiva, cornea, sclera; Uvea, sympathetic disease, aqueous; Glaucoma and ocular tension; Crystalline lens; Retina and vitreous; Optic nerve and chiasm; Neuro-ophthalmology; Eyeball, orbit, sinuses; Eyelids, lacrimal apparatus; Tumors; Injuries; Systemic disease and parasites; Congenital deformities, heredity; Hygiene, sociology, education, and history 703

NEWS ITEMS

- 749

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THE TONOGRAPHIC EFFECTS OF ECHOTHIOPHATE
(PHOSPHOLINE) IODIDE*REVERSAL BY PYRIDINE-2-ALDOXIME METHIODIDE (P_2AM)BERNARD BECKER, M.D., GILBERT C. PYLE, M.D., AND ROBERT C. DREWS, M.D.
Saint Louis, Missouri

Miotic agents such as pilocarpine, eserine, and di-isopropyl fluorophosphate (DFP) lower intraocular pressure by increasing the facility of aqueous outflow.^{1,2} Like DFP, echothiophate iodide³ is a potent long-acting inhibitor of cholinesterase. In contrast to DFP, it is water-soluble and reasonably stabile.³ Following such anticholinesterase compounds, the inhibited enzyme may be re-activated in vitro and in vivo by a number of oximes, such as pyridine-2-aldoxime methiodide (P_2AM).^{4,5}

In human eyes the topical application of echothiophate iodide produces miosis lasting for seven to 20 days. Furthermore, it is reported to be an effective agent in lowering intraocular pressure in glaucomatous eyes.⁶ The present study is a tonographic evaluation of the mode of action of this agent and a preliminary estimation of its usefulness in glaucoma therapy. In addition, data are presented to illustrate the ability of subcon-

junctival P_2AM to reverse both of the major ocular effects of echothiophate.

METHOD

Thirty normal eyes of 15 patients who volunteered for this study were subjected to tonography. A tracing was obtained on the right eye first in each instance. One drop of 0.25-percent echothiophate iodide was then instilled into the left eye, with the right eye serving as a control. The patients returned on the following day when repeat tonograms were obtained in the same sequence. Each patient was interviewed and examined in order to evaluate side-effects.

One hundred and six glaucomatous eyes of 55 patients were chosen for a trial on echothiophate iodide. There were 86 eyes with chronic simple glaucoma and 20 eyes classified as chronic secondary glaucoma. All had been on various forms of therapy (pilocarpine, epinephrine bitartrate, acetazolamide) and had been judged to be unsuccessfully controlled (intraocular pressure over 20 mm. Hg). Each patient was placed on one drop of 0.25-percent echothiophate iodide to be used once daily, preferably at night before retiring. This was added to their previous medical regime. They were required to return after one week for repeat tonographic tracings and subsequently at longer intervals if it was found feasible to continue them on the drug.

Pyridine-2-aldoxime methiodide was administered topically as a five-percent solution or injected subconjunctivally as 0.2 ml. of a

*From the Department of Ophthalmology and the Oscar Johnson Institute, Washington University School of Medicine. This investigation was supported in part by a research grant to the Department of Ophthalmology from Mrs. Edgar M. Queeny. The research relating to this study was also financed in part under a grant to Washington University School of Medicine made by the Alfred P. Sloan Foundation, Inc. The grant was made upon recommendation of the Council for Research in Glaucoma and Allied Diseases. Neither the foundation nor the council assumes any responsibility for the published findings in this study. Presented in part at the Midwest Section of the Association for Research in Ophthalmology, St. Louis, Missouri, April 19, 1958.

† Provided by the Campbell Pharmaceutical Company.

four-percent solution. Saline drops or injections were used in control eyes.

Tonography was carried out with a Mueller electronic tonometer connected to a Leeds and Northrup recorder. All values were expressed in terms of the 1955 Friedenwald tables.

RESULTS

Echothiophate iodide increased facility of outflow and reduced intraocular pressure in normal eyes. The miotic effect was manifest after one hour and lasted several days. In this series, the increase in outflow facility for the 15 normal eyes subjected to echothiophate iodide was significant and averaged 66 percent. The control eyes of the same individuals demonstrated no significant changes in outflow facility on repeated tonography (table 1 and figs. 1 and 2).

Side-effects in the normal group had a striking correlation to the magnitude of the response, and included, besides the miosis, ciliary and conjunctival injection, blurring of vision, ocular pain, and brow pain or headache. All of these symptoms improved within five days, although miosis persisted in some for 12 to 14 days.

Of the 86 eyes with uncontrolled chronic simple glaucoma, echothiophate iodide improved outflow facility by 25 percent or more in 62 eyes (72 percent), by 50 percent or more in 50 (58 percent), and by 100 percent or more in 34 (40 percent) (figs. 3 and 4). Intraocular pressure was lowered to 20 mm. Hg or less in 43 (50 percent) of these eyes with glaucoma previously uncontrolled on other medications.

In the smaller number of eyes (20) with secondary glaucoma, the results were similar to the chronic simple group: 14 eyes (70 percent) increased outflow facility by 25 percent or more, 12 (60 percent) improved by 50 percent or more, and nine (45 percent) by 100 percent or more (fig. 5). Furthermore, 11 eyes (55 percent) with uncontrolled secondary glaucoma showed a decrease in intraocular pressure to 20 mm. Hg or less (fig. 3).

With occasional exceptions, topical application of P₂AM proved ineffective in overcoming the miosis or tonographic changes of echothiophate. Subconjunctival injection of this agent, however, reversed the ocular effects of echothiophate in all seven glaucoma-

TABLE 1
TONOGRAPHIC EFFECTS OF TOPICAL ECHOTHIOPHATE IODIDE (0.25 PERCENT)
(Normal Eyes)

Patient	Age and Sex	Treated Eye (O.S.)					Untreated Eye (O.D.)				
		Before		After			Before		After		
		P ₀₁	C ₁	P ₀₂	C ₂	C ₂ /C ₁	P ₀₁	C ₁	P ₀₂	C ₂	C ₂ /C ₁
A	20 M	17	0.40	10	0.80	2.00	17	0.40	18	0.35	0.88
B	17 F	13	0.30	10	0.75	2.50	16	0.31	17	0.30	0.97
C	54 M	12	0.43	7	0.75	1.75	12	0.43	11	0.45	1.05
D	19 F	18	0.38	10	0.65	1.71	19	0.26	18	0.30	1.15
E	27 F	14	0.36	11	0.60	1.67	17	0.28	17	0.22	0.79
F	35 F	18	0.35	12	0.58	1.66	19	0.32	18	0.37	1.15
G	22 F	14	0.27	9	0.55	2.00	17	0.25	16	0.22	0.88
H	32 F	16	0.35	13	0.54	1.54	19	0.29	19	0.32	1.10
I	18 F	15	0.26	12	0.52	2.00	16	0.23	16	0.21	0.91
J	16 F	16	0.47	15	0.50	1.06	17	0.40	18	0.37	0.93
K	32 F	14	0.28	11	0.47	1.68	16	0.25	13	0.30	1.20
L	22 F	15	0.28	13	0.42	1.50	16	0.25	17	0.22	0.88
M	33 F	15	0.28	14	0.40	1.43	16	0.29	17	0.25	0.85
N	22 M	12	0.29	10	0.32	1.10	14	0.29	15	0.29	1.00
O	28 F	18	0.22	17	0.30	1.36	18	0.26	19	0.17	0.65
Mean		15.1	0.33	11.6	0.54	1.66	16.7	0.30	16.6	0.29	0.96
Standard Deviation						±0.36					±0.14

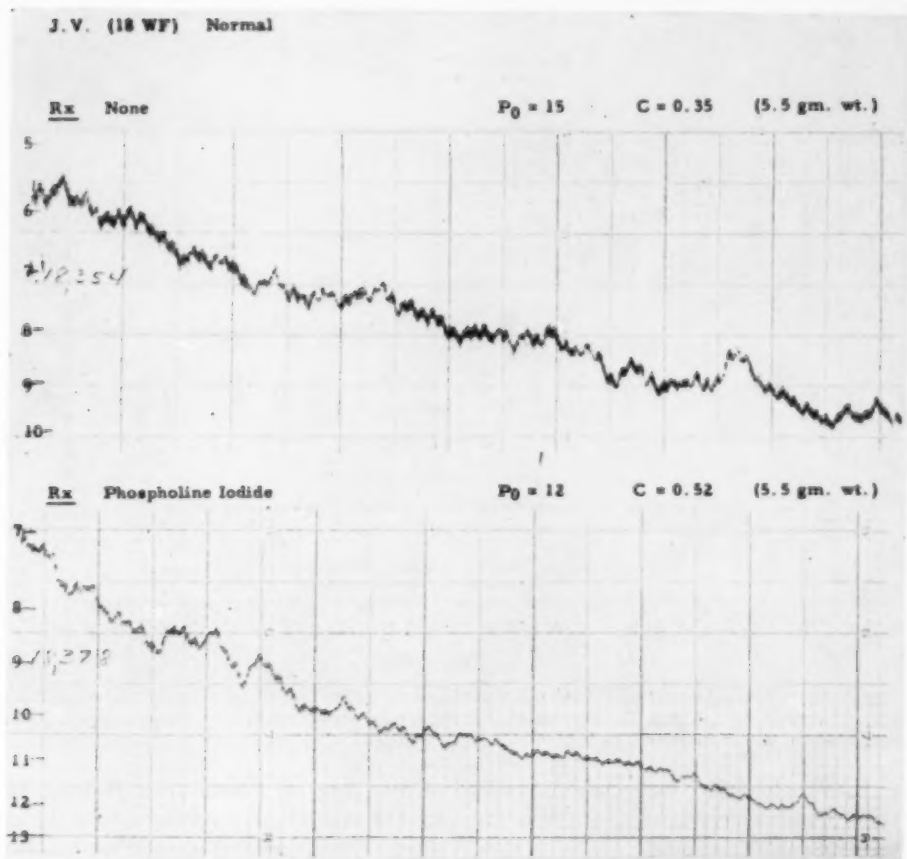


Fig. 1 (Becker, Pyle, and Drews). Tonographic tracings on the same normal eye before (above) and 24 hours after (below) the instillation of one drop of 0.25-percent echothiophate iodide.

tous eyes tested, resulting in dilatation of the pupil and decrease in outflow facility (table 2). The significant reduction in outflow facility (averaging 38 percent) was quite comparable to the total increase effected by echothiophate, thus restoring the eye to its pre-anticholinesterase status. The subconjunctival administration of P_2AM in a series of untreated normal or glaucomatous eyes failed in all instances to alter pupil size or outflow facility. Two out of six glaucomatous eyes under treatment with pilocarpine demonstrated significant decreases in outflow facility and rises in intraocular pressure, but without alteration in pupil size.

Side-effects of echothiophate such as ciliary and conjunctival injection, brow pain, headache, and transient blurring of vision were experienced by most glaucomatous patients. Such effects were similar to those in normal eyes and also tended to correlate with the pressure and facility response to the drug. When therapy was continued, these side-effects usually disappeared after the first few days. No detachments or drug sensitivity were noted in this series. However, iris cysts have occurred frequently in children, and several adults have experienced diarrhea. Systemic side-effects subsided when the drug was stopped or could be reversed promptly

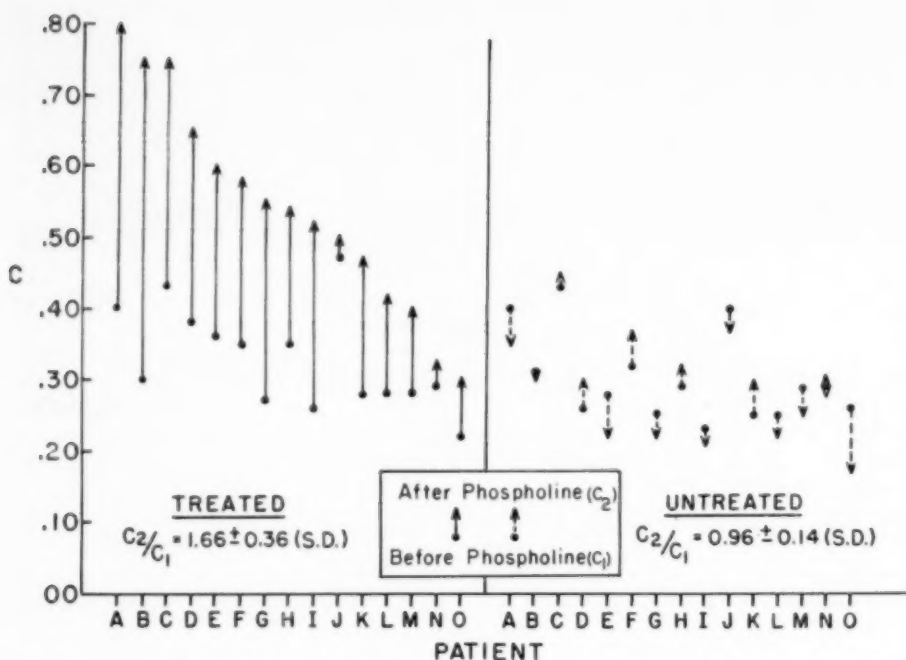


Fig. 2 (Becker, Pyle, and Drews). The change in outflow facility 24 hours following topical echothiophate iodide in 15 normal eyes. The controls are the untreated contralateral eyes of the same patients subjected to tonography at the same time interval.

by P_2AM . Recently three patients with chronic simple glaucoma have been seen who developed a severe fibrinous iritis after three

to five days of echothiophate therapy. In spite of cessation of the drug and the use of topical steroids, mydriatics, and subconjunctival P_2AM , the inflammation subsided slowly and posterior synechias formed.

TABLE 2

TONOGRAPHIC EFFECTS OF SUBCONJUNCTIVAL P_2AM (0.2 ML. OF FOUR-PERCENT SOLUTION): GLAUCOMATOUS EYES UNDER TREATMENT WITH TOPICAL ECHOTHIOPHATE (0.25 PERCENT)

Patient	Before P_2AM		After P_2AM		
	P_{01}	C_1	P_{01}	C_1	C_2/C_1
44	17	0.19	18	0.06	0.32
95	23	0.09	33	0.05	0.56
93	20	0.10	26	0.08	0.80
80	18	0.14	21	0.07	0.50
50	16	0.19	20	0.13	0.68
51	21	0.18	29	0.12	0.67
88	15	0.12	21	0.10	0.83
Mean	18.6	0.144	24.0	0.087	0.62
Standard Deviation					± 0.16

DISCUSSION

The present study confirms the findings of Leopold, et al.,⁶ that echothiophate iodide is a remarkably effective agent in lowering intraocular pressure. It appears to do so even in eyes uncontrolled on other miotics, and effects this lowering by improving the facility of outflow. Even in normal eyes, significant increases in outflow facility are induced by this drug. Like DFP, the use of this agent is probably contraindicated in eyes with narrow angles. Further evaluations of the chronic use of echothiophate iodide are in progress.

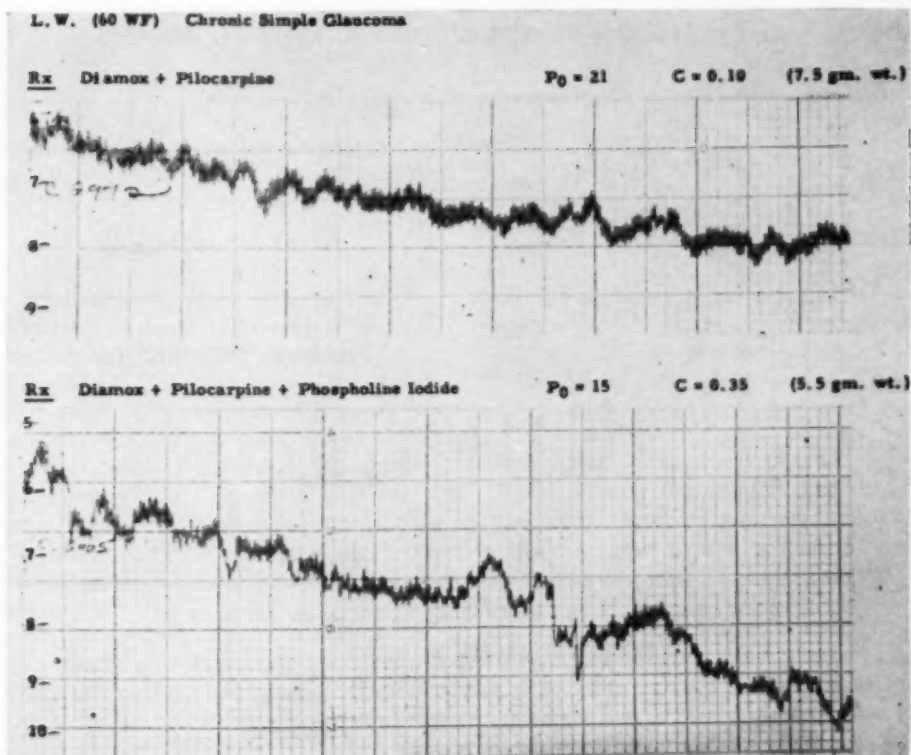


Fig. 3 (Becker, Pyle, and Drews). Tonographic tracings on the same eye with chronic simple glaucoma before (above) and after (below) the instillation of one drop of 0.25-percent echothiophate iodide.



Fig. 4 (Becker, Pyle, and Drews). The change in outflow facility following topical echothiophate iodide in 86 eyes with chronic simple glaucoma.

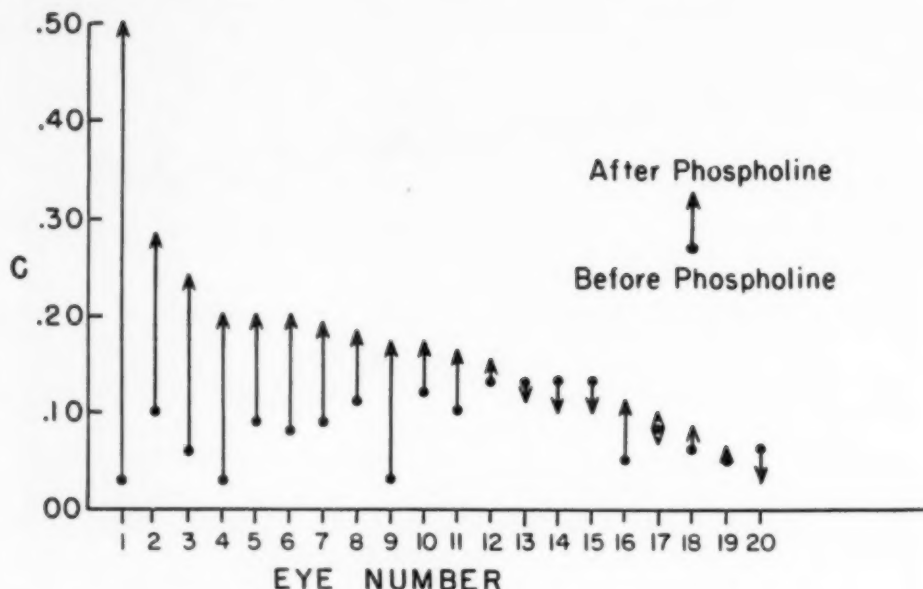


Fig. 5 (Becker, Pyle, and Drews). The change in outflow facility following topical echothiophate iodide in 20 eyes with secondary glaucoma.

SUMMARY

Echothiophate iodide is a potent long-acting water-soluble cholinesterase inhibitor. It lowers intraocular pressure by increasing the facility of outflow significantly in normal eyes. The addition of this agent (0.25 percent topically) improves the outflow facility sufficiently to result in better control in ap-

proximately 50 percent of glaucomatous eyes uncontrolled on other medical therapy. Subconjunctival pyridine-2-aldoxime methiodide (0.2 ml. of four-percent solution) reverses the pupillary and tonographic effects of echothiophate.

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GLAUCOMA CONTROL

RESULTS OF ROUTINE TONOMETRY IN 2,100 PATIENTS

A PRELIMINARY REPORT

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The early detection and the successful treatment of primary glaucoma offer an increasing challenge to the practicing ophthalmologist. It has been conservatively estimated that 12 percent of all blindness is the direct result of this disease¹⁰ which is one of the hazards of middle and advancing years. Glaucoma has a recognized incidence of more than two percent of all the population 40 years of age or over, and recent evidence from a pilot study by Horsley, et al.,¹⁴ supports the belief that half of the actual incidence probably remains unrecognized.^{18, 23} In an aging population this represents a tremendous and progressive cost, not only economically but also socially and emotionally. Much of it is preventable.

One reads of various types of glaucoma: absolute, chronic, open-angle, closed-angle, narrow-angle, wide-angle, acute congestive, chronic congestive, and noncongestive. One learns that each type presents its own problems in both diagnosis and management and discovers a rather general air of pessimism toward the outcome. The disease may exist for months or even years in a remediable but asymptomatic state before a gradual but irreversible loss of vision sends the patient to an ophthalmologist; on the other hand, a sudden burst of pain or a startling visual phenomenon may lead to an early diagnosis yet eventually result in blindness because of compromising treatment, the fruit of a hampering conviction that the disease is hopeless.

Thus we are presented with a three-fold problem: early recognition of a disease which is often insidious in both onset and progress, accurate classification of a condition befogged by confusing nomenclature, and

choice of a rational management where an inappropriate procedure is almost certain to result in even further deterioration of vision. Therein lies the challenge.

The ideal procedure to conquer glaucoma is to (1) screen, (2) establish diagnosis and classification, (3) treat, and (4) follow.

Recently many investigators have urged that general practitioners be encouraged to do tonometry in all physical examinations, as a screening measure.^{14, 19, 22, 23, 25, 26} While it would admittedly require a regular and repeated sifting of all people of the glaucoma age to reveal all remediable cases of the disease, much could be accomplished if every ophthalmologist made routine use of the tonometer following refraction of all patients in that age group. Certainly the chief responsibility in a glaucoma detection program lies with the ophthalmologist.

To establish the diagnosis and to classify the glaucoma during its earliest, most amenable stages it is necessary to make use of tonometry, gonioscopy, provocative tests, visual field examinations, and tonography. Each of these diagnostic procedures carries a considerable margin of potential error, inversely proportionate to the progress of the disease. Therefore it may sometimes be necessary to repeat any or all of these procedures, not once but many times, before one can with confidence decide upon the best course of treatment.

DEFINITION AND CLASSIFICATION

Since some of the perplexity surrounding the classification and treatment of glaucoma arises from a confusion of nomenclature, a definition of terms as they are used in this paper is in order.

Glaucoma refers to a pathologic condition of elevated intraocular pressure; 26 mm. Hg, as measured on the Schiötz tonometer, 1954 calibration table, has generally been considered safe, though in a recent study Porter²² confirmed glaucoma in nine patients having a tension less than that.

Etiology of the disease is a disputed matter but for reasons discussed in a previous paper²⁷ I subscribe to the mechanistic theory so ably advocated by Barkan² and Chandler.⁹ This theory assumes that increased intraocular pressure must be the result of one of two conditions: (1) obstruction to the outflow of aqueous humor while the inflow remains the same, or (2) increase in inflow while the rate of outflow remains the same. The latter is so rare that it will be disregarded in this paper, while the former resolves into two possible sites of obstruction: (1) at the entrance to the angle itself, or (2) within the filtering area, namely the trabeculae, the canal of Schlemm, the anterior collecting chambers, and the venous channels.

To facilitate management I attempt to reduce all suspected primary glaucomas to one of three classes, according to their mechanism: (1) narrow-angle, (2) wide-angle, and (3) combined. In doing this I have been guided by the anatomic classification of all eyes suggested by Kronfeld¹⁶ (figs. 1, 2, and 3):

Situation A—a deep chamber with a roomy peripheral portion.

Situation B—a moderately deep chamber

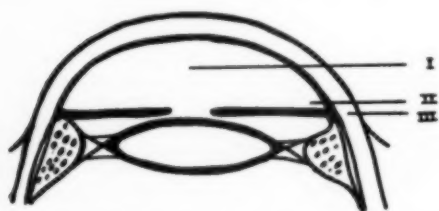


Fig. 1 (Sloan). Situation A, wide angle. (I) Deep roomy anterior chamber. (II) Wide open angle; aqueous has easy access to filtering area. (III) Filtering area.



Fig. 2 (Sloan). Situation B, intermediate angle. (I) Moderately deep anterior chamber. (II) Narrow angle has narrow entry way to filtering area. (III) Filtering area not easily accessible to aqueous.

with a plateau iris suggesting the possibility of a narrow entrance to the angle.

Situation C—an over-all shallow chamber suggesting a narrow entrance to the angle.

Obviously the eyes described in Situation C are more likely to have elevated intraocular pressure arising from obstruction to the aqueous outflow at the angle, since even a normal thickening of the lens may well provide sufficient mechanical obstruction to create such a condition in later life. Glaucoma developing in this situation will be referred to as narrow-angle regardless of the degree of closure, which may range from minimal obstruction to complete block, and by this definition probably includes a majority of the cases seen.

Obviously an elevated intraocular pressure in eyes belonging to Situation A must be the result of obstruction in the filtering area. Glaucoma in this situation will be referred to as wide-angle.

The cause of elevated pressure in eyes belonging to Situation B is not so obvious. It may result from either the narrow-angle or the wide-angle mechanism, or from a combination of the two. Even tentative diagnosis and classification of glaucoma in such eyes



Fig. 3 (Sloan). Situation C, narrow angle. (I) Very shallow anterior chamber. (II) Angle closed, may be partially open in some cases. (III) Filtering area not accessible to aqueous.

offers additional problems, to be discussed later, but the very effort leads to a rational sequence of steps in investigation and hence promotes more logical management.

In any eye, except those belonging to anatomic Situation A, both the narrow-angle and the wide-angle mechanisms may be at work simultaneously. This I term the combined mechanism. François, et al.,⁸ found that a change in the facility of outflow associated with a change in depth of the anterior chamber appears to be based on a change in trabecular structure; therefore, a combined mechanism may be the result of a neglected narrow-angle glaucoma.

The anatomic classification is first suggested by gross appearance, becomes more apparent on inspection with the slitlamp, and is determined by gonioscopy. This is the initial step in the functional approach to diagnosis. The mechanism producing the elevated tension must then be demonstrated, for even a small, hypermetropic eye with a shallow chamber may on further examination reveal an angle which is adequately open and therefore not culpable.

ESTABLISHING DIAGNOSIS AND CAUSATIVE MECHANISM

Finding an elevated intraocular pressure, even in a seemingly healthy eye and in the absence of subjective symptoms, initiates an investigation that is not to be abandoned until glaucoma is either ruled out completely or else confirmed and its causative mechanism determined. The next logical step is examination with the gonioprism. Though it may ultimately be concluded that the elevation was merely a temporary manifestation of nervous tension, its appearance makes a careful gonioscopic examination not only justifiable but mandatory.

GONIOSCOPY

Successful use of the gonioprism requires the development of a considerable degree of both patience and skill on the part of the examiner. Frequent re-examination in-

creases both the patient's ability to co-operate and the examiner's understanding of the individual structure. In this examination, where accuracy and effectiveness depend upon both the candidate's ability to fixate and the examiner's ability to maintain a satisfactory adjustment of the lens, it is of great help to have both the subject and the microscope in as stationary positions as possible. With the patient comfortably seated before the slitlamp, his head gently supported by an assistant, and the examiner free to concentrate on observation through a microscope supported on an adjustable standard, the angle can be carefully scrutinized. The filtering area may be nearly hidden behind the iris roll, and in some cases it may be only by repeated observations that one can determine whether or not the iris root is actually obstructing access to the trabeculae.

In my gonioscopic examinations I now use the Goldmann prism because I find that its narrow flange with well-rounded edges makes introduction easy, even in patients with a small palpebral fissure, and facilitates safe turning when inspecting various parts of the angle.

PROVOCATIVE TESTS

After the patency of the angle entrance has been estimated by gonioscopy, unless the mechanism is already obvious, the next step is to apply the provocative tests and measure their results by accurate tonometry, preferably tonography, supplemented by repeated gonioscopy.

Two provocative tests are used: (1) water-drinking and (2) mydriasis.

For the first, one quart of water is given on a fasting stomach, after an initial tension reading has been taken. If the tension rises 6.0 to 8.0 mm. Hg or more within a half-hour, then glaucoma is present and the fault lies in an obstruction of the filtering system in the scleral wall, indicating a wide-angle mechanism.

For the second provocative test, applica-

tion of a mydriatic such as Neosynephrine (10 percent) will cause a rise of pressure if the narrow-angle mechanism exists. In some instances an acute glaucoma may be precipitated by this test but, if the patient is promptly given miotics and sodium acetazolamide (Diamox) and kept under observation until the tension has returned to a satisfactory level, then such danger is minimized. In 5,143 consecutive refractions in my office on patients ranging in age from 40 to 85 years, using a cycloplegic or a mydriatic each time, only two cases of glaucoma have thus been precipitated. In both instances, immediate surgery resulted in the restoration of satisfactory vision, leading one to consider that under less compelling circumstances either or both patients might have missed the benefit of surgery until too late for a successful outcome.

It appears to me that mydriasis is too often neglected in the evaluation of glaucoma. This seems particularly true in the aged, where a visual loss is often wrongly attributed to normal lenticular changes and a mydriatic avoided as too hazardous. It is forgotten that even an occasional and moderate rise in tension may be indicative of progressive glaucoma which, if ignored or inadequately treated, will pass unnecessarily but inexorably into blindness.

Provocative tests and accurate tonometry, preferably tonography, are necessary diagnostic procedures in all borderline cases where the base pressure is not yet elevated above average limits, as well as in those cases which are anatomically classified Situation B.

TONOGRAPHY

In recent years our battery of diagnostic tests has been effectively augmented by the advent of tonography. This procedure affords the only clinical means of determining the facility of outflow of aqueous humor.³ Finding the ratio of intraocular pressure to facility of outflow following a water-drinking test is said to be a reliable method of

establishing diagnosis, a ratio of 100 or more proving glaucoma.¹²

Various investigators^{7, 10, 17} have independently reported that the facility of outflow, termed the C value, is rarely below 0.14 in normal eyes but is nearly always below 0.15 in uncontrolled glaucoma. Furthermore, an impaired C value in a glaucomatous patient under medical management presages field loss before any appreciable alteration in tension signals the danger.^{1, 4} Therefore, frequent tonographic examination of such patients promises an excellent opportunity for successful surgical intervention prior to nerve damage.

An additional advantage is that the calibration scale on the electric tonometer is approximately seven times greater than that of the Schiøtz, making the readings correspondingly more sensitive. This is especially helpful in dealing with borderline elevations, and is a further aid in early diagnosis.

Unfortunately, the impression has somehow become current that tonography is impractical in a private office. My own experience has been quite the contrary. I have been using an Esterline-Angus recorder and an adapted electric tonometer since June 1, 1956, and I am convinced of the value of tonography as an office procedure (figs. 4 and 5).

To illustrate the value of tonography let us consider a specific case. Assume that at the close of refraction in a patient of the



Fig. 4 (Sloan). Electric tonometer and recorder. Note sturdy chair. Voltage stabilizer is out of view.

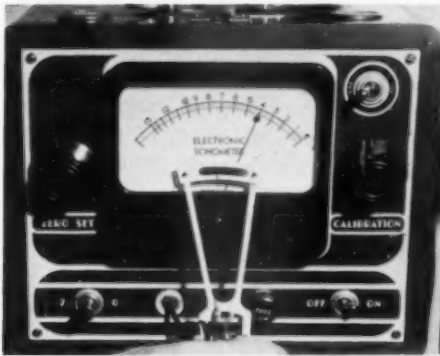


Fig. 5 (Sloan). Close-up view to show comparison of calibration scales, Schiotz versus electric tonometer.

glaucoma age, routine tonometry shows a tension of 40 mm. Hg in an eye which by gross inspection appears to have the shallow chamber of anatomic Situation C. There are no field changes, and questioning elicits no subjective symptoms. A miotic immediately restores the tension to 20 mm. Hg or less. These findings all suggest a narrow-angle glaucoma but are not conclusive. So the patient is put on miotics and scheduled for tonography within the next few days, at which time the water-drinking tests shows a normal facility of outflow. This irrefutably demonstrates that a narrow-angle mechanism, now under the temporary control of a miotic, was the cause of the elevated tension. By this time the patient may begin to recall forgotten episodes of subjective symptoms, intermittent over the past months or years.

But consider another patient, also belonging to anatomic Situation C, and also without subjective symptoms. In this case tonography in conjunction with the water-drinking test reveals an impaired facility of outflow, verified by repetition. Therefore, despite anatomic classification and the gross suggestion of a narrow angle, one is forced to conclude that the second case represents a wide-angle mechanism, and treatment will be planned accordingly.

The first patient is an ideal subject for

peripheral iridectomy. The second patient may be treated either medically or surgically, as dictated by circumstances and the ophthalmologist's experience, but in any event he will not be a candidate for peripheral iridectomy, since there is adequate evidence that a defective filtering area is at fault.

In other instances, definitive information is not so easily obtained, or the evidence may be puzzlingly contradictory, sometimes pointing toward one mechanism, sometimes toward the other. Such a pattern of response indicates that the two mechanisms co-exist. Tonography provides the only clinical means of ascertaining this dual mechanism.

VISUAL FIELD STUDIES

Visual field studies are of only limited value in establishing diagnosis at an early stage of glaucoma.

In the narrow-angle mechanism it may be years before the characteristic field changes become apparent. Therefore such studies are useful only insofar as a normal field shows that no permanent damage has yet been done. The intermittent acute and subacute phases are not revealed.

In detection of wide-angle glaucoma such studies are of more value, for here the onset of the disease is even more insidious, so that the field changes, though late, may be the first overt sign of pathology. Unfortunately, by that time the disease is already well established and permanent injury has been done to the optic nerve.

Early recognition, then, depends chiefly upon tonometry followed by both gonioscopy and the provocative tests in conjunction with tonography and repeated gonioscopy.^{14, 19, 22, 23, 25, 28}

TREATMENT

There was a time when glaucoma was a synonym for impending blindness. Treatment fell into one of two categories: palliative attempts at medical control or forced surgery. Accomplishment was measured in terms of how long total loss of vision was

delayed. Though neither form of treatment was outstandingly successful, it was perhaps only natural that the more radical procedure should fall into the greater disrepute, for, as with all delayed surgery, the results were too often unfortunate. Nearly a decade ago Friedenwald⁹ made this pronouncement against surgical intervention in narrow-angle glaucoma:

It follows that operation for glaucoma rarely leaves the eye in the same state as it was before, and even when the operation is successful in adjusting the intraocular pressure, the glaucomatous process in respect to the occlusion of the chamber angle is usually worse, sometimes very much worse.

His statement must have profoundly influenced the treatment of all primary glaucoma during the intervening years and frequently deterred doctors from performing a peripheral iridectomy when such procedure would have been curative. The present strong trend toward earlier recognition of the disease, together with a general improvement in surgical technique, demands that we re-evaluate his dictum.

Every ophthalmologist can testify to a sudden shocking loss of vision in a glaucomatous patient whom he felt was under medical control: maintaining normal tension, appearing free of symptoms, and seen with a frequency intended to prevent such a calamity. But the use of miotics to maintain "normal" tension does not necessarily result in normal physiology, for "normal" is too frequently confused with "average," which may be rather different. Friedenwald⁹ coined the useful term "normative" to indicate that ocular pressure which is compatible with continued health and function for a given individual. In like vein, McDonald²⁰ asserted that there is no such thing as "normal" pressure. He wrote instead of "critical" pressure, that point above which the individual loses function; the critical pressure might be as low as 25 mm. Hg or as high as 45 mm. Hg.

If definitive treatment awaits the development of continuously elevated pressure or

obvious signs of optic atrophy, then a great area of the filtering system will already have been permanently damaged. No filtering procedure can be expected to carry the whole load in a completely failing eye, and the restoration of such an eye to normative function is no longer possible.

A survey of recent literature seems to indicate that surgical management is gaining adherents. This is a logical sequel to the improved results made possible by earlier surgical intervention, which in turn is the product of earlier diagnosis.

Becker² reports a strong argument for prophylactic surgery in "closed-angle" because it has been found that there is a 40-percent incidence of acute glaucoma in the fellow eye. De Carvalho⁶ warns that even when ocular tension appears to be under medical control there is a progressive field loss in a high percentage of cases, and therefore surgery should not be postponed indefinitely.

Hill,¹² while deploring the unpredictable result of surgery in open-angle glaucoma, avers that the younger age group should have the benefit of surgery before field changes are progressive, and that surgery is also indicated for all who are disinclined to follow a strict medical regimen. McLean²¹ concurs.

Haas and Scheie¹¹ favor peripheral iridectomy as a protection against future attacks. Kessler¹⁸ is a proponent of iridectomy at as early a stage as possible, and is supported by Shaffer.²⁶ Riise²⁴ is convinced that if visual acuity declines after glaucoma surgery, then the loss is attributable to lenticular changes inherent in the individual; he feels that we are justified in surgical regulation of intraocular pressure at an early stage of the disease on the hypothesis that it will result in the preservation of useful vision for a minimum of eight years.

McDonald²⁰ alone echoes Friedenwald in concluding that vision will be no better after surgery, and probably will be worse except in cases of "acute congestion."

In narrow-angle glaucoma it may be true

that the physiology is temporarily altered by peripheral iridectomy but, if the vision is preserved and the patient is symptom free after this procedure, then I believe the operation has been justified. In my own experience, out of 42 eyes diagnosed as having narrow-angle glaucoma by the terms of the definition given earlier in this paper, 40 eyes benefited by peripheral iridectomy. Surgery on some of these eyes antedated the current study by eight years.

It is my belief that a peripheral iridectomy should be done in all narrow-angle cases as soon as the diagnosis is established.

Management of both the wide-angle and the combined mechanisms must be determined on an individual basis. Whenever feasible I prefer to do an anterior flap sclerotomy with iridencleisis on wide-angle glaucoma, and to manage relatively early cases of the combined mechanism by anterior flap sclerotomy with peripheral iridectomy. Medical measures I reserve for those cases where surgery is refused or else is unwarranted because of either temperamental unfitness or a minimal life expectancy.

FOLLOW-UP

Whatever the treatment decided upon, the glaucoma patient must be impressed with the importance of reporting for follow-up. Once a diagnosis of glaucoma is established, or is even strongly suspected, the patient is told to feel free to come to me at any time that he becomes aware of visual symptoms. Office personnel are instructed to expedite the office calls of these people, in an effort to determine any possible rise in pressure or change in facility of outflow.

Aside from this, a regular schedule of examination is established. Postoperative cases are followed first at weekly intervals, lengthening to three-month, six-month, and perhaps even yearly intervals if such optimism seems justified. But a glaucoma patient is never dismissed.

RESULTS OF ROUTINE OFFICE TONOMETRY

Appended is a preliminary tabulation of the results of routine tonometry on all patients 40 years of age or over who came to me for refraction from January 1, 1956, through May 19, 1958.

During this time a total of 4,781 refractions were done in my office, and of this number there were 2,158 patients in the glaucoma age group. Fifty-eight of these had to be eliminated for various reasons: four refused tonometry, 11 were known glaucomas, 10 had secondary glaucoma, eight were lost to follow-up, and 25 had repeated refractions. This left a total of 2,100 subjects eligible for the current study.

A tension of 26 mm. Hg or more (Schiotz 1954 calibration table) was found in one or both eyes of 77 patients. To date, glaucoma has been established and classified in 45 cases, ruled out in two cases, and is still suspected but not verified in the remaining 30, all of which remain under observation. This gives a proved incidence of 2.14 percent, to date, subject to upward revision.

The 45 verified glaucomas are classified in this manner: eight cases of wide-angle; 17 cases of narrow-angle; 20 cases of combined mechanism; three additional cases are still unclassified.

Each of the 17 cases classified narrow-angle mechanism presented binocular glaucoma in varying degrees of closure. Each of these cases has now had peripheral iridectomy in both eyes, with complete relief of symptoms to date.

Three of the wide-angle cases, totaling five eyes, have had surgery, with complete relief in two cases (involving three eyes) and only partial relief in the third case (involving both eyes). The two remaining cases in this category are under medical treatment.

The 20 cases of combined-angle mechanism involved a total of 39 eyes. Of these, seven cases (13 eyes) have had surgery, with complete relief in six eyes and partial relief in seven eyes. The remaining 13 cases

(26 eyes) in this group are under medical management.

While admittedly inconclusive and incomplete, these results appear to support the contention that peripheral iridectomy is the procedure of choice for narrow-angle glaucoma in any stage of closure before the filtering area is affected. By the definition of narrow-angle glaucoma used in this paper, the majority of cases belong in this group and hence are amenable to such a procedure. The preponderance of the combined mechanism in this series of cases underlines the potential complication of a neglected narrow-angle glaucoma.

SUMMARY AND CONCLUSIONS

To await the development of positive deterioration is to go against the generally accepted practice in treating any disease; this should be equally true of glaucoma. Even though the establishment of diagnosis and determination of the responsible mechanism may require six months or a year, or even longer, yet it is justifiable because, in the end, one is able to offer a potential cure. The alternative, unnecessary delay or compromising treatment, offers no hope of cure; instead, it forebodes endless medication, a possible acute episode risking immediate loss of vision, or, ultimately and at the least favorable time, a forced filtering operation with attendant lens complications which will

make cataract extraction necessary in the future.

If a screening program could detect these potential victims early in the course of their disease, then surgery could be done when indicated on all who would accept it, and many would thereby gain years of useful vision that would otherwise be denied them.

The final decision as to treatment rests upon careful clinical judgment, but that in turn depends upon making the greatest possible use of all the diagnostic tools at our command. Therefore, to control glaucoma it seems advisable to

1. Do routine tonometry on all patients over 40 years of age when they are refracted.

2. When tension is over 26 mm. Hg (Schiotz) use the gonioscope to classify anatomically, and then study functionally by means of the provocative tests in conjunction with electric tonography and gonioscopy.

3. Do immediate peripheral iridectomy on proved narrow-angle glaucoma and a prophylactic procedure on the fellow eye.

4. In wide-angle and combined-angle mechanisms, choose treatment on the merits of the individual case but follow every medically managed glaucoma with tonography to anticipate field changes.

5. Follow every patient with glaucoma until his death.

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THE VALUE OF ELECTRORETINOGRAPHY*

IN THE DIAGNOSIS OF PIGMENTARY DEGENERATIONS OF THE RETINA

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INTRODUCTION

The differentiation of retinitis pigmentosa from secondary retinal degeneration may present a formidable task for the ophthalmologist. Etiologies which may produce secondary pigmentary changes resembling retinitis pigmentosa include syphilis, malaria, typhus, scarlet fever, diphtheria, measles, vaccinia, parotitis epidemia, intoxication, trauma, retinal cysts, siderosis, and myopia.^{1,2} The characteristic ring scotoma of early retinitis pigmentosa may also be found in syphilis, gyrate atrophy, choroideremia, and glaucoma.³ Until recently the evaluation of a case was based on clinical findings,

laboratory data, and psychophysical testing including, in particular, adaptometry. Within the last 10 years an objective test, the electroretinogram, has been added to the diagnostic armamentarium of ophthalmologists. The purpose of this study is to evaluate further the significance of this test.

The experience of most workers with the electroretinogram in retinitis pigmentosa has been to find either (1) a completely extinguished record^{1,3-5} which is the response reported in the great majority of cases, (2) a completely extinguished b-wave with a minimal[†] negative deflection obtained at

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†A "minimal response" refers to a record in which the components are not easily measured and often may barely be distinguished from the baseline. Responses less than 25 microvolts have been arbitrarily included in this category in this study. A

maximal intensity stimulation,⁸⁻¹¹ or (3) a minimal positive with or without a minimal negative deflection.^{7,10,11}

The presence of a minimal negative or positive deflection has been reported primarily by workers using very high intensity light stimulation, such as that obtained with the stroboscopic lamp; however, François⁹ reported one case with a minimal b-wave response obtained by the Karpe technique⁸ (max. of 80 lux). All of the elicited responses appear to be either described as barely distinguishable from the baseline or are less than 25 microvolts in magnitude when pictured. No conclusions can be drawn about the existence of a relationship between the severity of a case and the absence or presence of a minimal response.

In secondary pigmentary degenerations the electroretinogram has been reported to be normal or subnormal;^{1,3,4,9} however, in very far-advanced cases with diffuse destruction of the external layers of the retina, the electroretinogram is extinguished. One can usually predict the type of response by the fundusoscopic appearance of these cases.

METHOD

The evaluation of a patient with pigmentary degenerations included routine clinical examinations, and electroretinographic studies in all cases. Visual fields, uveitis surveys, and dark-adaptation studies with the Goldmann-Weekers adaptometer were done as indicated.

Patients studied with the Goldmann-Weekers adaptometer¹² were placed in complete darkness for five minutes, and then in a preadapted illumination of 2400 lux for 10 minutes. These values for duration and brightness of the preadapting light were found sufficient to give a complete biphasic

cone-rod response in normal individuals. The test stimulus was centered 11 degrees below a small red fixation light and a test patch of 11 degrees visual angle was used in testing an eccentric area which included a representative cone density and the heaviest rod density. In certain cases an integral threshold which is thought to be an evaluation of the entire field of vision,¹ was studied. An intermittent presentation using the rotating sector was used because of ease of identification in comparison to a steady presentation. The pupils were undilated and an artificial pupil was not used.

The examination was done with the testing light set at a maximum of 20 lux and an attempt was made to maintain a constant rate of change of intensity of the testing light. The method of recording used was that described by Gunkel and Bornschein,¹³ in which the thresholds of appearance and disappearance were both noted and the true threshold was then estimated to be the mean of these two values. Testing was carried out for 30 minutes and the response of the patient was noted at least every one-half minute for the first 10 minutes, every one minute for the second 10 minutes, and every two minutes for the final 10 minutes.

Electroretinographic recordings were done with the patient at rest on a hospital bed. Simultaneous recordings were made from both eyes using Burian-Allen contact lens electrodes, a direct writing eight-channel Grass electroencephalograph, and a Grass photic stimulator as a light source.^{14,15} Normal values were based primarily on studies by Goodman and Iser,^{14,15} who used identical techniques, and upon our studies of normal eyes. These are: 100 to 200 microvolts for the x-wave, 250 to 500 microvolts for the b-wave, and 55 to 75 flashes/sec. for the photopic critical fusion frequency.

RESULTS

Electroretinograms were obtained on 31 patients with pigmentary degenerations from the clinics of the Illinois Eye and Ear In-

"subnormal response" denotes a record in which there is a general depression of all components or, as in the terminology used by Karpe⁸ and Henkes,¹⁴ a depression of the scotopic b-wave in particular. In a subnormal response all components are easily seen and measured.

firmly, the Research and Educational Hospitals of the University of Illinois, and referred patients from other hospitals in the Chicago area. Nineteen cases of retinitis pigmentosa were studied which fell into the following electroretinographic patterns: Sixteen cases had completely extinguished records, two cases had minimal negative deflections which were obtained at maximal intensities which were obtained at maximal intensities in the scotopic records, and one case had a minimal positive deflection noted in the photopic record at the two highest intensities. In 10 cases of secondary pigmentary degeneration we noted subnormal or normal recordings. The two cases which are to be discussed presented unusual diagnostic problems.

CASE REPORTS

CASE 1

L. S., a 26-year-old Negress, had had difficulty seeing well for both distance and near since childhood. There was no history of night blindness and the past history was not suggestive of syphilis. The patient has had six children without any miscarriages. There was no history of trauma or the relationship of the onset of ocular symptoms to bacterial or viral diseases.

Significant clinical findings included: (1) best corrected visual acuities of 20/40 in both eyes, (2)

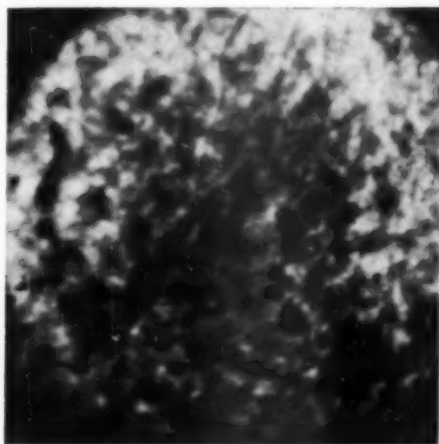


Fig. 1 (Krill and Iser). L. S. Secondary pigmentary degeneration. Fundus right eye. Arteriolar attenuation and bone spicule pigmentation are shown.

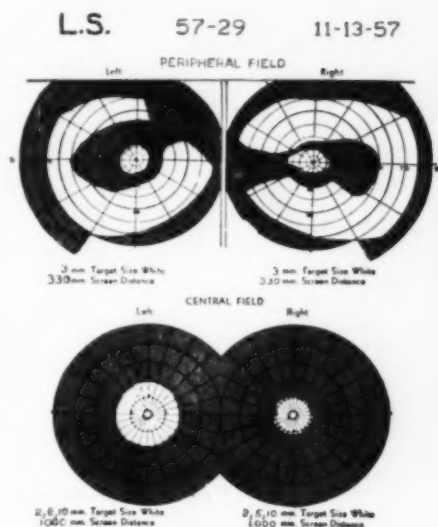


Fig. 2 (Krill and Iser). L. S. Peripheral and central fields. Bilateral ring scotomas are shown.

diffuse bone spicule pigmentation and arteriolar attenuation in both fundi (fig. 1), and (3) visual fields demonstrating bilateral ring scotomas (fig. 2). Laboratory studies including serology were normal. Adaptometer studies were repeated on four occasions and both integral and eccentric fields were tested (fig. 3). These were all normal. The electroretinogram (fig. 4) showed x-waves of 50 microvolts in the right eye and 25 microvolts in the left eye, and b-waves of 100 microvolts in the right eye and 75 in the left eye.

DISCUSSION

This case demonstrates both a fundus picture and visual field findings which could be characteristic of retinitis pigmentosa. The history, dark adaptation studies, and electroretinogram were not characteristic of this disease. Consequently, this case was diagnosed as a secondary pigmentary degeneration despite the lack of evidence for any etiology. Both the dark adaptation and electroretinogram findings in this case were compatible with this diagnosis. The presence of a normal or an elevated but biphasic type of dark adaptation curve is the usual finding in secondary pigmentary degenerations of chorioretinitis.^{1, 9, 17} Only in the type of far-advanced case where an extinguished electro-

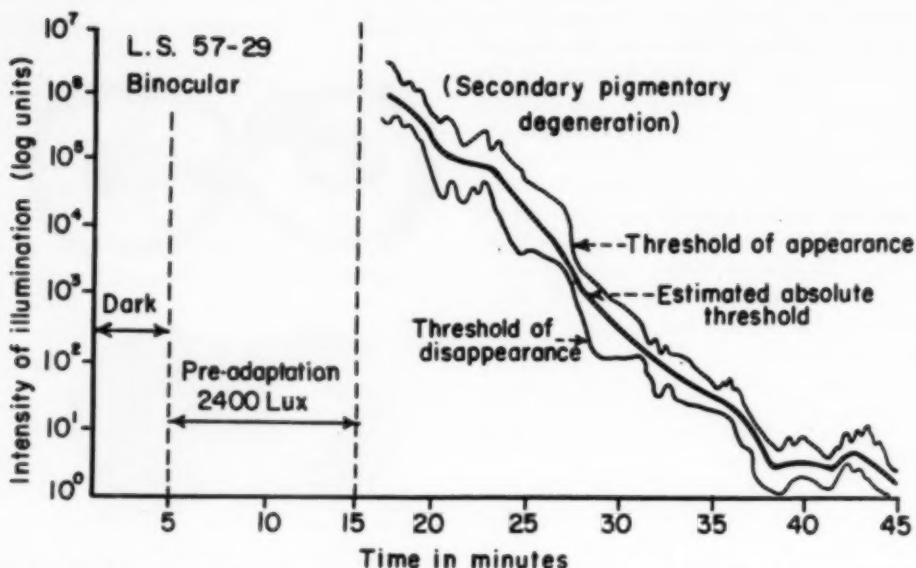


Fig. 3 (Krill and Iser). L. S. Binocular dark adaptation (eccentric 11-degree field). A biphasic cone-rod response with an unusually low threshold is shown.

retinogram is obtained is there a radical alteration of dark adaptation.

CASE 2

P. M., a 42-year-old white man, had a history of night blindness, difficulty seeing to the side, and difficulty reading since 1950. There had been a gradual progression of these symptoms. There was no history suggesting luetic disease, trauma, or the onset of ocular symptoms in relation to viral or bacterial diseases. The family history was negative for night blindness.

Significant clinical findings included: (1) visual acuities of 20/200 in both eyes, (2) fundi revealing fine bone spicule pigmentation in the periphery, diffuse spotty pigmentation in both macular areas, and no areas showing old or new patches of choroidal atrophy (fig. 5), and (3) visual fields revealing bilateral ring scotomas (fig. 6). A uveitis survey was noncontributory. Dark-adaptation studies of an eccentric 11-degree area showed an elevated cone threshold and no rod response (fig. 7). The electroretinogram revealed a minimal photopic single flash response, a minimal flicker response with fusion at about 30 flashes per second, and an average b-wave of about 175 microvolts (fig. 8).

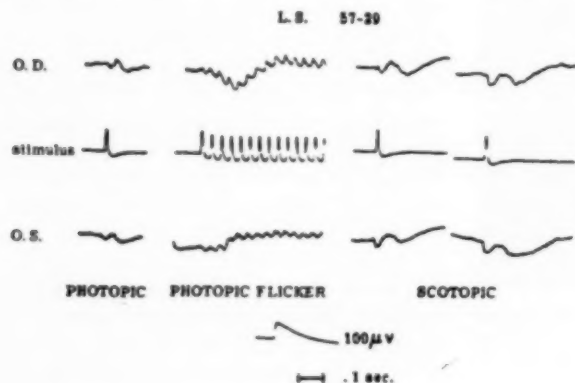


Fig. 4 (Krill and Iser). L. S. Electrophoretogram. A subnormal response is shown in both eyes.

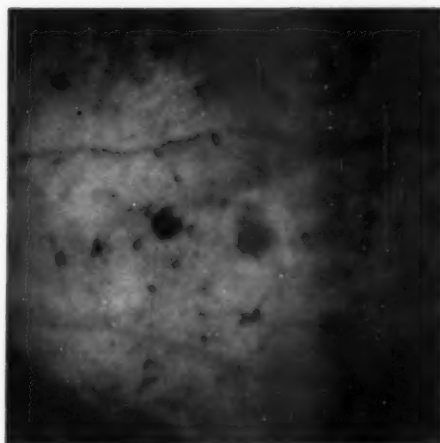


Fig. 5 (Krill and Iser). P. M. Retinitis pigmentosa. Fundus right eye. Fine bone-spicule pigmentation is shown in the midperiphery.

DISCUSSION

This case demonstrates peripheral pigmentary changes in the fundi, visual fields, and dark adaptation impairment typical of retinitis pigmentosa, and, in addition, bi-

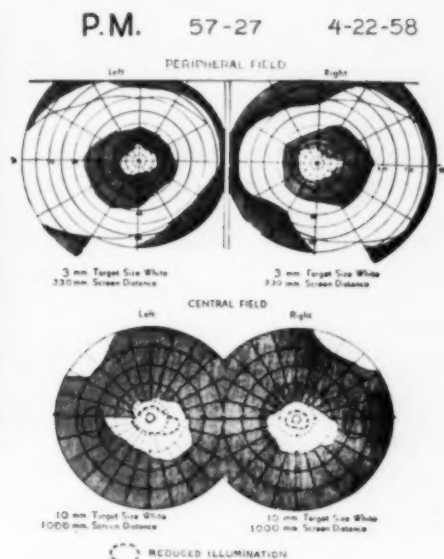


Fig. 6 (Krill and Iser). P. M. Peripheral and central fields. Bilateral ring scotomas are shown.

lateral macular degeneration. The electroretinogram does not fall into one of the

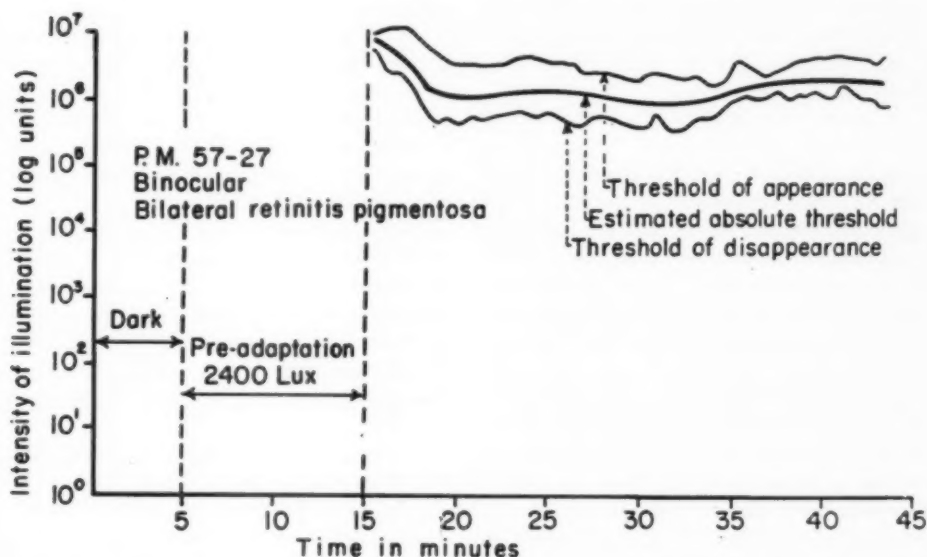


Fig. 7 (Krill and Iser). P. M. Binocular dark adaptation (eccentric 11-degree field). A cone response with an elevated threshold is seen. No rod response was obtained.

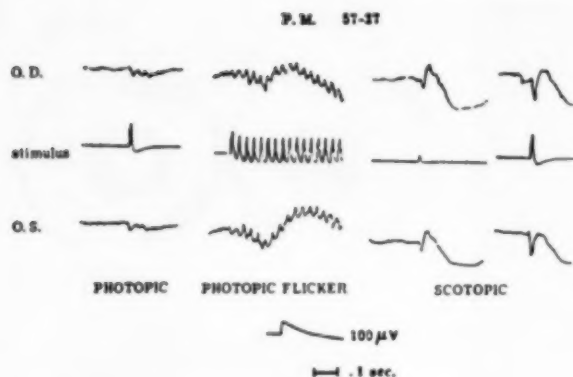


Fig. 8 (Krill and Iser). P. M. Electroretinogram. A subnormal response was obtained from both eyes.

typical patterns, nevertheless this case was diagnosed as retinitis pigmentosa.

Dark-adaptation studies were of great value in diagnosis in this case. Supposedly most cases of retinitis pigmentosa are characterized by an early history of night blindness and thus changes in the dark adaptation curve may be an early finding. The changes which have been described in this disease include: (1) contraction and eventual disappearance of the rod portion of the dark adaptation curve, (2) elevation of the final rod threshold when a rod response is noted, and (3) elevation of the cone threshold both in the fovea and periphery.

A subnormal response in a probable case of retinitis pigmentosa was reported last year by Passmore, Skeechn, and Arming-ton.¹⁸ Goodman¹⁹ studied two families with dominant retinitis pigmentosa in which extinguished or minimal responses were found in the oldest members. Four of the younger members studied showed some clinical evidence of retinitis pigmentosa and demonstrated subnormal tracings; and two members with no clinical evidence of the disease demonstrated normal tracings. In view of the cases previously reported and the one referred to today, it is presumed that a subnormal record may be a possible response in retinitis pigmentosa, although probably an extremely rare one. This supposition may be related to any or all of the three following hypothetical explanations.

If it is assumed that some extinguished records are due to responses being below the sensitivity of the recording apparatus,²⁰ then increasing the sensitivity of the latter or the magnitude of the response may change an extinguished response to a minimal one, or by the same reasoning a minimal response to a subnormal one. It is postulated that the lack of subnormal responses and the few minimal responses in retinitis pigmentosa may have been related in some degree to the techniques used.

Until the last four or five years most workers were using light sources which produced illuminations of 20 to 80 lux. Under these conditions the a-wave was usually not elicited,²¹ or just barely distinguishable from the baseline in normal individuals. With the stroboscopic light source now used by many workers an illumination of over 500 lux is produced and an a-wave is always seen at the higher intensities in normal individuals. Also the positive deflections are related to the intensity of the stimulus^{22,23} and consequently the magnitude of the entire record may be increased with the more intense light stimulus.

The quality of the recording can be improved by oscilloscopic techniques, by better designed amplification systems, or by a technique of tuned amplification used with flicker stimulation.²⁵ Henkes²⁴ studied 12 cases of retinitis pigmentosa with extinguished responses and by using this technique obtained

at least a flicker response in four cases.

Retinitis pigmentosa may be too inclusive a diagnosis. Falls²⁵ has hypothesized six different modes of inheritance for retinitis pigmentosa and also differentiated different clinical patterns in the different modes of inheritance. Severity, sex, age of onset, and associated defects are related to the pattern of inheritance. Perhaps the electroretinographic findings can be correlated in this manner and then the extinguished electroretinogram, which appears to be far the most common response in retinitis pigmentosa, may be related to the recessive and dominant pattern of inheritance. A rare subnormal type of electroretinogram may be related to a rare hereditary pattern in this disease which may have a different degree or type of pathologic involvement.

The third possibility is that the electroretinographic response in some patients is related to the stage of the disease, and thus if early cases are recorded one may find more minimal and a few subnormal responses. The two families studied by Goodman¹⁹ substantiate this thesis. In our series it has not been possible to correlate the electroretinographic response with the age, visual acuity, or visual field findings of the patients.

CONCLUSIONS

1. The electroretinogram is of valuable aid in the differential diagnosis of pigmentary degenerations of the retina. A primary pigmentary degeneration, such as retinitis pigmentosa, will most often be characterized by an extinguished or minimal electroretinogram and a secondary pigmentary degeneration will most often be characterized by a normal or subnormal electroretinogram.

2. A subnormal electroretinogram is a rare finding in retinitis pigmentosa; however, it is consistent with the diagnosis of this disease.

3. A comprehensive survey including electroretinography and adaptometry should be done in any doubtful cases.

SUMMARY

1. Nineteen patients with retinitis pigmentosa studied at the University of Illinois were characterized by extinguished records in 16 cases, a minimal negative deflection with maximal intensity stimulation in two cases, and a minimal positive deflection in one case.

2. The 10 patients with secondary pigmentary degenerations studied were characterized by normal or subnormal patterns.

3. Two unusual patients were discussed in detail. The first patient had secondary pigmentary degeneration resembling retinitis pigmentosa, and the second had retinitis pigmentosa with a subnormal electroretinographic response. The relationship of the electroretinographic findings to the final diagnosis was discussed in each case.

4. Dark-adaptation studies were presented in the two patients and the relationship of dark-adaptation changes to the type of pigmentary degeneration was discussed.

5. Three possible explanations were presented to explain the rarity of a subnormal electroretinogram in retinitis pigmentosa.

6. The value of the electroretinogram in pigmentary degenerations was re-emphasized.

ADDENDUM

Since this article was submitted 18 more patients with retinitis pigmentosa were studied. Fifteen cases had completely extinguished records, one had a minimal negative and positive deflection, and two had subnormal responses.

One of the patients with a subnormal response was a 51-year-old white man whose findings were very similar to the patient discussed in this paper and the other patient was a 13-year-old girl who appeared to represent an early dominant form of the disease. The latter patient showed fundus changes and her father and all of his siblings were found to have retinitis pigmentosa. The father and one uncle were tested

and found to have extinguished electroretinograms.

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MODIFICATION OF FACILITY OF OUTFLOW*

BY PERFUSION OF THE VITREOUS CHAMBER IN THE ENUCLEATED CAT EYE

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Considerable information has been accumulated in recent years pertaining to factors controlling the resistance to outflow of aqueous humor. It is now evident that the principal site of resistance is the trabecular meshwork of the filtration angle.

Bárány and co-workers^{1,2} have shown by perfusion of enucleated eyes that the structures determining resistance to outflow are hyaluronidase-sensitive. Later, Zimmerman³ showed by histologic methods, and Vrabec⁴ by a delicate replica casting technique, that hyaluronic acid was present in the trabecular meshwork. Berggren and Vrabec⁵ demonstrated clearly that this substance was removed from the trabeculae by perfusion, thus adding the anatomic feature to Bárány's original observation.

A second level of control of resistance to outflow is apparently mediated by some excitable system. The ciliary muscle has been suggested as the effector of phasic adjustments of resistance by Fortin⁶ and by Purnell, Melton, and Adams.⁷ Flocks and Zweng⁸ have shown that cholinergic drugs such as pilocarpine favorably affect facility and cause changes in the state of contraction of the ciliary muscle which would account for the improvement in outflow. If the neuromuscular mechanism of adjustment of resistance is reflex in nature, it is possible that nerves demonstrated by Holland, von Sallmann and Collins^{9,10} in the tissues of the filtration angle represent the afferent limb.

Becker and Constant¹¹ have revealed that

the facility of outflow is directly proportional to the depth of the anterior chamber and that facility expressed per unit volume of the anterior chamber yields a figure which is fairly constant for animals having different values of facility.

In carrying out experiments on the effects of various drugs on the facility of outflow as determined by perfusion of enucleated cats' eyes, it became desirable to use both eyes from the same animal. It was intended that one eye would serve as a control and the other as an experimental eye. Control experiments involving perfusion with buffered saline of the anterior chambers of eyes from the same cat revealed that there was rarely agreement between the two eyes with regard to the change in facility with time. It seemed that the anterior chambers of the two eyes might be enlarging at different rates by backward displacement of the lens and iris as suggested by Purnell and co-workers,⁷ thus introducing an error into determinations of facility by perfusion over a prolonged period.

The experiments reported here were designed to test such an idea by equalizing the pressure before and behind the lens.

METHODS

Enucleated eyes from 40 mature cats, randomly chosen as to sex, size, and age, were perfused by the horizontal pipette method essentially in the same manner as that described by Bárány.^{1,2} The experimental arrangement is shown diagrammatically in Figure 1. The eyes were removed rapidly from heparinized animals anesthetized with sodium pentobarbital given intraperitoneally. No consistency was observed as to which eye was removed first. The enucleated eye was quickly cleaned of extraocular tissue and

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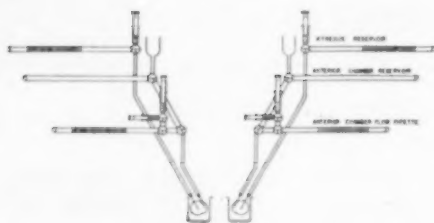


Fig. 1 (Melton and Hayes). Diagram of experimental equipment showing flow pipettes, reservoirs, and associated syringes for refilling. The control eyes were set up on the left hand apparatus, in which cases the vitreous cannula was sealed and not connected to the vitreous reservoir.

was cannulated with 23-gauge needles into the anterior chamber and the vitreous compartment.

The anterior chamber cannula was connected by polyvinyl tubing and stopcocks to a horizontal 1.0 cc. pipette reservoir and a 0.2 cc. horizontal pipette graduated in microliters which was used for determinations of flow rate. The stopcock arrangement was such that when the flow pipette was cut in, the reservoir was cut out. By means of this arrangement the eye was perfused without interruption for the entire experiment. Flow determinations were made on each eye every 10 minutes. The procedure followed in all cases was to allow 5.0 μ l. to flow in, then the time for the inflow of the next 10 μ l. was measured to the nearest 0.1 second with a stopwatch.

The vitreous compartment cannula of the experimental eye was connected to a 0.2 cc. horizontal pipette which served as a vitreous flow pipette. The vitreous compartment cannula of the control eye was sealed, a procedure which afforded some control of the trauma involved in cannulation. All pipettes and connecting glassware were siliconized.

The assumption was made that eye volume remained constant and, consequently, that the rate of inflow after the eye was filled equalled the rate of outflow. The heights of the reservoirs and flow pipettes were equal and adjusted so that the perfusion pressure was 28.37 mm. Hg in all experiments. The

facility of outflow is expressed as microliters per minute per millimeter of mercury pressure. The perfusion fluid was Ringer-Locke solution at a pH of 7.4.

It was found in earlier experiments that a great deal of initial difference between eyes from the same animal could be eliminated if the second eye was removed as quickly as possible after the first eye. An interval of five minutes usually intervened between removal of the first and second eye.

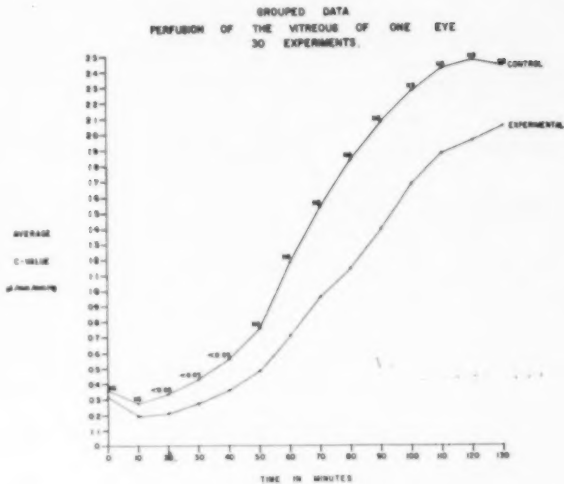
The facility of outflow was also found to be sensitive to temperature. Initial difference between eyes was minimized when the perfusion was carried out in a constant temperature bath at 37°C. In all of the experiments reported here, the anterior chamber was first cannulated and then the eye was lowered by means of a manipulator carrying the cannula into a small plastic funnel which was contained in a 50 ml. beaker. The beaker was previously filled with perfusion fluid and equilibrated in the constant temperature bath. After the eye was situated in the bath, the reservoirs were cut in and the eye was allowed to fill. As soon as the initial influx of fluid from the reservoir ceased the anterior chamber reservoir was turned off and initial flow determinations were made. Inflow rates were measured at 10-minute intervals over a period of 130 minutes.

RESULTS AND OBSERVATIONS

As Bárány,^{1,2} Becker,¹¹ and others^{7,12} have shown, the resistance to outflow decreases with time of perfusion. In these experiments the graph of facility versus time usually showed such a change to a plateau in 50 to 100 minutes (fig. 2). In 35 of the 40 experiments the rise was preceded by a decrease in facility. This decrease began to be evident by the second reading and facility did not return to the zero-time value for an average of 40 to 50 minutes (fig. 2). The rapidly rising portion of the curve occurred between 40 and 110 minutes after the beginning of perfusion.

The values for each time interval for all

Fig. 2 (Melton and Hayes). Grouped data of the 30 experiments involving perfusion of the vitreous chamber of one eye. Upper curve, control data; lower curve, experimental data. The 20-, 30-, and 40-minute points are different statistically at the five-percent level of significance. All other points are not significantly different. Ordinate, facility values; abscissa, time in minutes.



controls and experimentals were averaged and graphed (fig. 2). Each pair of points on the curves was analyzed by Student's *t*-test for significance of difference in the means. The 20-, 30-, and 40-minute average values were found to be different at the five percent level of significance. All other points were not different statistically. This analysis indicated that vitreous perfusion was without marked effect in altering the rate of inflow of perfusion fluid into the anterior chamber.

The impression was gained from examination of the graphs of individual experiments, however, that the largest differences occurred, that is, perfusion of the vitreous was most effective, in experiments in which the experimental eye accepted no, or only small amounts of, fluid from the vitreous reservoir. The experiments were grouped according to whether or not the vitreous compartment accepted more than 10 μ l. over the 130-minute period. Those eyes which accepted 10 μ l. or less into the vitreous were designated for brevity's sake as "no flow" experiments and those eyes which accepted more than 10 μ l. were designated as "flow" experiments. There were eyes from 18 cats in the "flow" group and 12 in the "no flow" group.

"Flow" experiments. The eyes in this group accepted from 14 to 393 μ l. into their vitreous compartments over the 130-minute period (table 1). The average control facility of outflow increased from 0.35 to 2.63 in 120 minutes. The average experimental eye facility of outflow increased from 0.33 to 2.53 in 130 minutes (fig. 3). When the two curves were analyzed point by point for significance of difference in the means, it was found that the values of the two curves belonged to the same population.

Small amounts of fluorescein in the fluid perfusing the vitreous left the eye by way of the anterior chamber. No leaks at the site of cannulation of the vitreous chamber could be detected.

"No flow" experiments. The experimental eyes in this group accepted from zero to 10 μ l. into their vitreous compartments (table 1). The average facility of outflow in the control eyes increased from 0.37 to 2.28 in 130 minutes. The experimental eyes increased in facility from 0.31 to 1.43 in 130 minutes (fig. 4). The average facility of outflow of the experimental eyes was significantly depressed from the 20-minute determination to the 120-minute determination. The means of the facility values of the

TABLE 1
COMPARISON OF VOLUMES OF FLUID ACCEPTED BY THE VITREOUS COMPARTMENT IN "FLOW"
AND "NO FLOW" EXPERIMENTS

"Flow" into Vitreous—18 cats		"No Flow" into Vitreous—12 cats	
Experiment Number	μ l. of Fluid Accepted by Vitreous	Experiment Number	μ l. of Fluid Accepted by Vitreous
116	67	117	0
118	72	123	0
119	80	125	10
120	246	128	4
121	80	130	1
122	43	132	7
124	27	133	3
126	103	134	3
127	393	138	0
129	15	144	2
135	111	145	5
136	57	147	5
137	14		
139	42		Average 3.33
141	32		
142	165		
143	30		
146	26		
Average 89.05			

two groups were not significantly different at the zero time determination, 10-minute determination, or at the 130-minute determination (fig. 4).

Experiments with vitreous compartments of both eyes cannulated. Eyes from 10 cats were used in these experiments in which the vitreous compartments of both eyes were

cannulated. In these eyes there was less than 10 μ l. flow into the vitreous. The facility values ranged from 0.39 to 1.52 in one eye and from 0.33 to 1.97 in the other eye (fig. 5). Analyzed in the same manner as the other groups, no statistical difference between the two groups of eyes could be demonstrated.

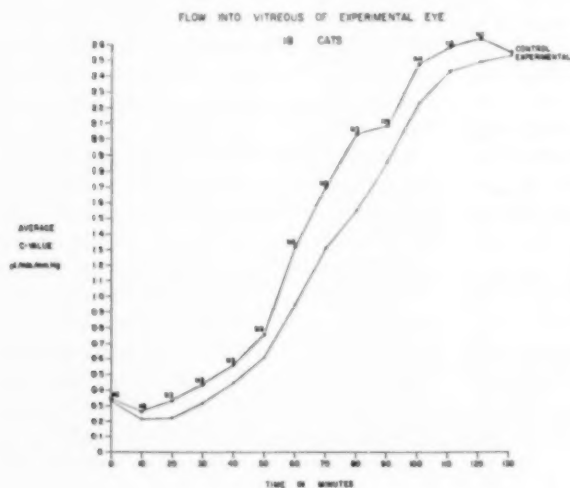
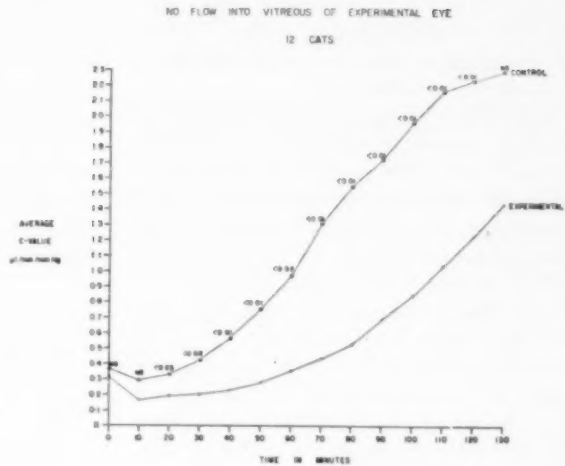


Fig. 3 (Melton and Hayes). Graphed data of 18 experiments in which there was more than 10 μ l. flow into the vitreous chamber of the experimental eye. None of the points are significantly different. Ordinate, facility values; abscissa, time in minutes.

Fig. 4 (Melton and Hayes). Graphed data of the 12 experiments in which there was zero to 10 μ l. flow into the vitreous of the experimental eye. The first two and last pairs of points are not significantly different. Ordinate, facility values; abscissa, time in minutes.



COMMENT

It has been pointed out by Ballantine in his discussion of the paper of Becker and Constant¹¹ that even though the facility values of eyes perfused in vivo and in vitro agree fairly well, the facility as determined in enucleated eyes is initially low and erratic but when it becomes stabilized is always greater than that in situ. It has been pointed out by Purnell⁷ and it has been the observation in this laboratory that the blood contained in the intraocular structures readily drains out if the animal is heparinized.

The uveal structures thus depleted of blood undergo shrinkage of volume and allow the lens and iris to be displaced posteriorly. The consequent enlargement of the anterior chamber would account for the higher facility determined in enucleated eyes.

One puzzling aspect of facility as determined by perfusion, however, is that the initial facility value does not agree with the reported in vivo determinations.¹¹ Rather, it is the plateau value which agrees best; a value which, according to Bárány's experiments, is attained by washing out of hyalu-

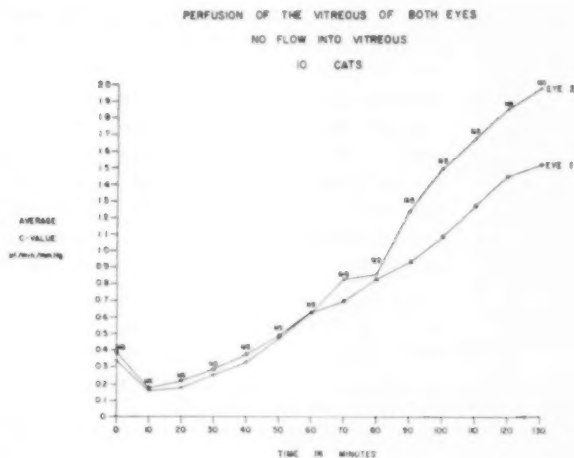


Fig. 5 (Melton and Hayes). Graphed data of the 10 experiments involving perfusion of the vitreous chambers of both eyes. None of the points are significantly different. Ordinate, facility values; abscissa, time in minutes.

ronic acid and is a maximum value. This gives rise to the interesting speculation that the cat's eye *in vitro* is initially depressed in its facility of outflow.

One aspect of the perfusion method introduces an uncontrollable error into the measurement. This error is brought about by trauma to the eye incident to removal and cannulation of it. There is no doubt that the two eyes are only rarely, if ever, traumatized exactly to the same degree. Bárány has shown that traumatization (massage) has the same effect as hyaluronidase. It is felt for this reason that the perfusion method of studying the outflow system of the eye can never be precise enough so that pairs of eyes can be compared except on a statistical basis. The question, therefore, remains open as to whether or not the two eyes of the same cat agree very closely in their respective facilities of outflow.

The experimental eyes which accepted large amounts of fluid into their vitreous compartments agree in facility of outflow with their controls. This observation suggests that either the lens and iris are relatively firmly bound in some eyes and are not free to be displaced posteriorly or that the iris is freely permeable to the perfusing solution and the pressure before and behind the lens of the control eye quickly equilibrates.

The mean facility of outflow of those experimental eyes which accepted 10 μ l. or less into their vitreous compartments is significantly depressed from the control mean. In this case it appears that the small amount of fluid entering the vitreous compartment cannot leave and thus occupies the space into which the lens would be displaced. The question of why this fluid does not leave the vitreous compartment is an interesting one deserving further investigation. Small

amounts of fluorescein in the fluid entering the vitreous can be seen to be localized about the point of the needle when the eye is frozen and opened. It is possible that the hyaloid membrane in these eyes is not permeable to the perfusing fluid. The difference between these eyes can be virtually eliminated by cannulation of the vitreous compartments of both eyes. The characteristic is, therefore, bilateral.

SUMMARY

Facility of outflow of pairs of eyes from 40 cats was determined over a 130-minute period by the horizontal pipette perfusion method. One eye of each pair, the experimental eye, was also perfused via the vitreous compartment. The average initial facility of outflow for all of the eyes was 0.35 ± 0.17 . The experimental eyes which accepted more than 10 μ l. into their vitreous compartments increased in facility of outflow to an average value of 2.63 while the control eyes increased to an average value of 2.53 in 120 minutes. Perfusion of the vitreous was without effect on facility in these eyes. The experimental eyes which accepted less than 10 μ l. into their vitreous compartments increased in facility of outflow to a value of 1.43 while the controls increased to 2.28 in 130 minutes. The average facility of outflow was depressed significantly from the 20-minute determination through the 120-minute determination. Cannulation of the vitreous compartments of both eyes of a pair abolishes the difference between them.

It is concluded that backward displacement of the lens and consequent deepening of the anterior chamber is a factor contributing to the increase of facility of outflow as determined by perfusion of enucleated eyes.

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FLUORESCING ILLUMINATION IN CATARACT SURGERY*

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That ultraviolet light may be used safely and to advantage in cataract surgery has been adequately demonstrated. In 1940 I described a new type of mercury-vapor lamp with filter, utilizing the biologically harmless band of ultraviolet light just beyond the visible spectrum, which if directed into the eye will cause the lens to fluoresce.¹ Such fluorescing illumination increases the efficiency of visualization during certain phases of cataract extraction.

I have now used this lamp (manufactured by the American Optical Company) in cases of cataract extraction at the Millard Fillmore Hospital for over 18 years with great benefit. That this light is not universally employed is, I believe, because the technique of its use is not clearly understood so that it may be utilized most effectively. Furthermore, a device put on the market for the same purpose, a filter to fit over an ordinary ophthalmic surgical light, delivers only one percent as

much fluorescence, as measured by the Macbeth illuminometer. The original fluorescing lamp designed by Hildreth is, of course, excellent from the standpoint of light engineering.

There are certain situations in which the lens cortex or capsule can be seen better when brightly fluoresced, and it goes without saying that with better visualization there can be better control of its manipulation. The brightness of such fluorescence does not vary with any qualities of the lens or cataract—normal lenses, immature and mature cataracts fluoresce with equal brilliance—but it does vary greatly with the intensity of the fluorescing light. Thus ultraviolet light of low intensity will not produce enough fluorescence for adequate visualization.

IMPORTANT FACTORS IN FLUORESCENCE OF OCULAR STRUCTURES

The ideal source of ultraviolet light for eye surgery provides a spot of light limited in area to little more than the eye itself, and of the highest intensity of near ultraviolet

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compatible with the lowest possible intensity of accompanying visible green, yellow, and red light. Otherwise it would have the optical and mechanical features of the special, narrow-beam, white-light spotlamps available for general operating purposes. This means that the light must be very concentrated at its source, and that there must be a compact optical system and a specially designed or selected filter. Nothing less than the output of 85- or 100-watt high-pressure mercury lamps has been found satisfactory.

Modern sources of near ultraviolet differ from the early so-called Wood's lamp as much as do modern incandescent lamps from Edison's first experiments. The differences are so great as to discourage the perpetuation of the inventor's names, especially since lamps were but a part of Edison's hundreds of patents and were the least of Dr. Wood's work. In 1915 Dr. R. H. Wood suggested, for purposes of military secret signalling, isolation of the 3,650 Å line from the then available low-pressure mercury lamps by an experimental glasslike filter material. This filter could only be made in crude cylinders by laboratory methods. Neither the mercury lamps nor the cylindrical filters proved practical for signalling purposes but they came to be widely used in the theater when the Jena (Germany), Chance (England), and Corning (U.S.A.) glass companies developed high-silica tube glass filters which could be used close to hot, high-intensity mercury arcs and could be molded by production methods into flat plates.

Many variations in filter transmissions followed. Theoretically the filters have an absorption band over most of the visible spectrum, and transmission on either side of the band in the near red, or infrared, and the near ultraviolet. Unfortunately there seems to be no way of obtaining high transmission of the near ultraviolet (3,650 Å mercury line) without some transmission of the visible red and violet. Demonstrations of fluorescence, such as theatrical effects, are done with a considerable overtone of purple

from the red and violet but the more exacting uses of near ultraviolet light for analytical, criminologic, and medical purposes require a light which is much less contaminated by visible blue and red. Eye surgery, one of the most exacting of these uses, has necessitated the specification of a special filter which sacrifices some 3,650 Å transmission to obtain a minimum of the deep red.

In recent years a wide range of sizes of tubular low-intensity mercury fluorescent lamps have been available. Their phosphors provide an emission band at from 3,400 to 4,200 Å with a maximum or peak at about 3,600 to 3,900 Å. Since this is partially visible, a filter may be used, as with nonfluorescent mercury lamps. Often the lamp tube itself is of filter glass, the so-called integral filter. These and other separately filtered, low-pressure mercury lamps are suitable for diagnostic work but of little value in eye surgery. For instance, I examined a filter intended to be placed over an ophthalmic operating lamp (purportedly to provide ultraviolet fluorescence) brought out by one well-known manufacturer. I found that, when measured with a brightness meter, this device delivered only one percent of the fluorescence delivered by the lamp I designed. It would appear possible that trial of this clearly inefficient device may have helped to bring about misunderstanding of the very helpful technique fluorescent lighting provides for cataract surgery. One other fluorescent lamp, similar to one advocated recently for ophthalmic diagnostic fluorescence, was found to deliver four percent of that produced by the lamp I described, although, I believe that close to 100 percent is required for adequate utilization.

The special problem in cataract surgery is to be able to see small fluorescing particles below the slightly fluorescing cornea. A minimum of visible light from the lamp is essential for this, and while there is value in even higher intensities of the ultraviolet, the value does not increase in proportion to the intensity. An important limitation is in the cor-

neal fluorescence of the surgeon's own eyes by ultraviolet reflected to them from the patient's face; hence the need for a spot of ultraviolet of the smallest practical size. The surgeon can wear Crooke's or Novial lenses to some advantage.

CATARACT PROCEDURES

EXTRACAPSULAR EXTRACTION

Making the incision and placing the sutures are best done with ordinary surgical illumination. Then the operating light may be turned off, leaving only approximately 25 foot-candles of illumination from a rather dim ceiling light or from a wall light for viewing X-ray film. The circulating nurse stands beside the patient's head, on the operative side, and holds the ultraviolet cataract lamp, which has been turned on a few minutes previously in order to develop full fluorescence, about 15 to 18 inches from the eye to be operated upon. With the handle provided the lamp is easy for her to hold. Its beam must fall directly on the eye. It is then easy for the operator to visualize the capsule as it is being opened, whether or not the corneal flap is being elevated.

Extraction of the lens, including lens and capsule fragments, by irrigation will be facilitated because these particles can be better seen than by any other illumination. If irrigation is used, it is particularly advantageous to see how lens fragments are being displaced when they are not entirely freed, so that the direction and force of the irrigation stream may be changed. It is also possible while using the ultraviolet light to have an assistant retract the flaps while the surgeon grasps and removes lens fragments, including those lying on the vitreum. When this has been accomplished the ordinary surgical light may again be turned on for closure of the incision.

INTRACAPSULAR EXTRACTION

During intracapsular extraction, ultraviolet illumination may be used to visualize any

fold in the capsule as it is grasped. Ordinary illumination is often adequate for this purpose but ultraviolet is better. The lamp is also very useful in the visualization of lens residue should the capsule tear during extraction.

LINEAR EXTRACTION

During linear extraction, ultraviolet illumination offers a decided advantage both in control and technique. In fact the indications for linear extraction may be somewhat extended with the aid of this light. What is happening to the lens capsule and its contents may be seen much more clearly with fluorescing illumination. This is true both while the capsule is being opened and while a fine-tipped irrigator is being used to break up the lens mechanically by direct manipulation or by an irrigating stream. As the irrigating stream is varied in force and direction to dislodge and separate lens particles from the cortical-capsular matrix, these particles sometimes remain attached to the matrix by a narrow band, causing them to revolve inside the anterior chamber. When they can be seen clearly, change in the force and direction of the stream will bring extraction to a successful conclusion. Thus control of the irrigating technique is achieved far more completely with fluorescing illumination. Also it is easily possible to see fragments of lens material lying in or near the incision which might otherwise be overlooked. By this technique, using both irrigator tip and the stream to dislodge and wash out lens material, I have never, in linear extraction, experienced loss of vitreum.

COMMENT

Light, including surgical illumination, is often taken for granted. In ancient times it was believed that the eye emitted some ray which was reflected from the object seen back into the lens, where vision was believed to "occur." We now understand that the eye sees objects that reflect light from an ex-

traneous source. A surgeon's visual acuity depends upon the intensity of illumination, the surgeon's eyes, contrast with the background (which is particularly marked with fluorescing illumination), the spectral component of the light, and whether or not the objects seen are magnified, as with a loupe. With magnification of the field greater illumination is required.

Lest the surgeon take light for granted, he may recall that some of the fibers in the optic nerve go to the hypothalamus where impulses which they initiate affect the pituitary region. The related phenomena of photoperiodicity are beginning to be studied intensively. The duration of exposure to light, the specific wavelength of light to which organisms are exposed, and sometimes the intensity of illumination influence or even control the growth and morphologic development of seeds, plants, fungi, unicellular insects, birds, fish, reptiles, and mammals.

For instance, lettuce seed can be made to show 100-percent germination by five minutes' exposure to pure red light, while germination can be completely inhibited by five minutes' exposure to infrared light. Certain birds can, in the Fall of the year, be made to go into Spring migration and breeding, with a 2,000-fold increase in the size of the ovaries and testicles, by nothing more than increasing the length of their exposure to light by five minutes each successive day.² Other organisms show comparable sensitivity to light. A group of soldiers exposed to light of unusually high intensity, which was being developed as a military weapon in World War II, stated that they believed they had been rendered sterile thereby.

Today's eye surgeons would scarcely be content with the amount of illumination used in 1890, which sometimes amounted to 60 foot-candles, or to that of 1920, when the one

light usually used delivered 150 foot-candles at the eye. Many still use a light which delivers only 300 foot-candles at the eye, although other available sources deliver 600 and more foot-candles.

Is the use of the ultraviolet light in eye surgery worth the trouble entailed? I am sure that I have extracted many cataracts in which this special illumination was not needed. However, I am sure that a good many other cases would not have turned out as well without its use, including those cases in which it was desirable to grasp residual cortex or capsule, even that lying on the vitreous face, as well as all cases of linear extraction, in which, with fluorescing light, the irrigator tip may be used to dislodge cortex, either by force or a fluid stream, or by mechanical force from the tip itself.

These remarks suggest that there is more to surgical illumination than appears to meet the eye, which does, of course, become partially dark-adapted when fluorescing surgical illumination is used. Finally, it must be remembered that some of the operative procedures discussed here are safe only when pressure from the vitreous humor has been reduced by such drugs as tubocurarine chloride or hyaluronidase.

SUMMARY

In this discussion of special surgical lighting, a brief survey of basic concepts and practical considerations has been given to enable the surgeon to evaluate or modify his own technique. Data that may be found in engineering textbooks have been omitted.

A combination of lighting and surgical technique that extends the scope of linear extraction has been presented. It is believed that the use of fluorescing (near ultraviolet) illumination in cataract surgery saves eyes.

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A NEW APPROACH TO SURGERY OF THE INFERIOR OBLIQUE MUSCLE

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Operations on the inferior oblique muscle have been performed for at least a hundred years. In fact it is supposed that an itinerant practitioner, John Taylor,¹ did such an operation for squints in the middle 18th century, although he kept his method a secret. Dunnington² states that Bonnet described the operation of tenotomy in 1841. It was thought that the operation could influence severe myopia. Landolt³ outlined the anatomy and a technique for tenotomy in 1885. The next reference is in 1906 when Duane⁴ reported the results of a series. He stated that operation is useful in:

A. Paralysis (or paresis)* of the superior rectus of one eye with or without spasm of the inferior oblique of the opposite eye.

B. Paralysis (or paresis) of the superior oblique with secondary spasm of the inferior oblique of the same eye.

C. Paralysis (or paresis) of the superior rectus with compensatory spasm of the same eye.

White⁵ in summarizing 27 years of experience in surgery of the inferior oblique did not add to Duane's indications. Payne⁶ reviewed cases operated for the correction of vertical tropia at the New York Eye and Ear Infirmary for two years and noted that the inferior oblique was selected for surgery in 90 percent of the operations. In all but six patients another muscle, either a lateral or the opposite superior rectus, was included in the surgery. Payne stressed orthoptic treatment before and after surgery. Scobee⁸ stated, "Overaction of the inferior oblique is present in 68.6 percent of cases showing a hypertropia." Girard⁷ cites as reasons for choosing the inferior oblique for operation:

A. The high incidence of overaction of the

inferior oblique in paresis of other vertically acting muscles.

B. The surgical accessibility of the inferior oblique.

C. The wide range of correction that may be obtained.

D. The advantages of weakening an elevator, it being less hazardous than weakening a depressor.

Fink⁹ also stresses the disadvantage of weakening a depressor because of the need for downward gaze in the greater period of our lives.

Before taking up the technique, or the choice of surgery of the inferior oblique, a few points on anatomy should be cited:

According to Scobee⁸ the inferior oblique has no tendon, its insertion is 9.6-mm. wide and the muscle is approximately 37-mm. long. Near the muscle's insertion the muscle sheath of the inferior oblique fuses with the muscle sheath of the lateral rectus and this attachment may be quite firm. The sheath also sometimes fuses with the sheath of the optic nerve.

Fink⁹ notes that the macula is 1.0 mm. from the inferior oblique insertion, and that the optic nerve is 0.8 to 1.0 mm. from the insertion. The posterior ciliary arteries enter the sclera adjacent to the posterior end of the inferior oblique insertion. The short ciliary arteries and nerves lie 3.5 mm. around the optic nerve. The inferior vortex vein is 1.0 mm. anterior to the posterior border of the inferior oblique muscle and 8.0 mm. below the line of insertion of the inferior oblique. Fink cites Motais,¹¹ who stated that in many cases a firm union exists between the inferior oblique and the inferior rectus fascial sheaths. Fink¹⁰ emphasizes that effective surgery of the inferior oblique includes division of both of the attachments of its

* Parentheses are mine.

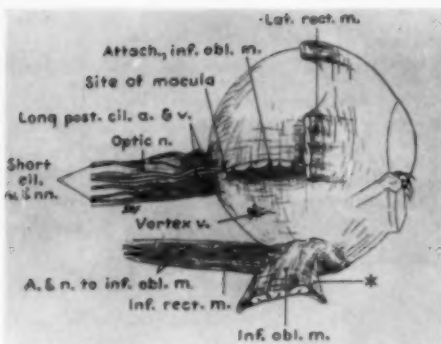


Fig. 1 (Zugsmith). Anatomy in the region of the attachment of the inferior oblique (Fink®).

sheath to the lateral rectus and to the optic nerve, and caution is required in separating the latter when it is present.

The surgical approach to the inferior oblique was demonstrated by Dunnington² who described the skin route, the conjunctival route, and the posterior approach.

The skin route was described by White,¹² although Landolt³ advocated the use of the supraorbital notch as a landmark for locating the origin of the inferior oblique through a skin incision in 1885.

According to Dunnington,² "An incision 15 mm. to 20 mm. long is made through the

skin and the orbicularis along the inferior orbital margin so that the central point is opposite the attachment of the muscle (figs. 2 and 3). A lacrimal sac speculum is inserted and a muscle hook is inserted at the temporal end of the incision with its point in contact with the floor of the orbit and pushed back into the orbit for five mm.; then being careful to keep the point on the orbital floor, the hook is turned to face nasally and swept up and in. This maneuver necessarily catches the inferior oblique and as it presents it is surrounded by orbital fat and fascia" (fig. 4). It can readily be seen why not many operators use the skin method at the present time. The skin scar itself would be ample contraindication.

The conjunctival route, as described by Dunnington, was ascribed to Parker¹³ who stated only that, "It was possible to do the operation through a conjunctival incision." No description was furnished.

Dunnington describes the conjunctival route as follows: "To bring the conjunctival cul-de-sac into view traction sutures are



Fig. 2 (Zugsmith). First step in skin incision approach to inferior oblique (Dunnington®).

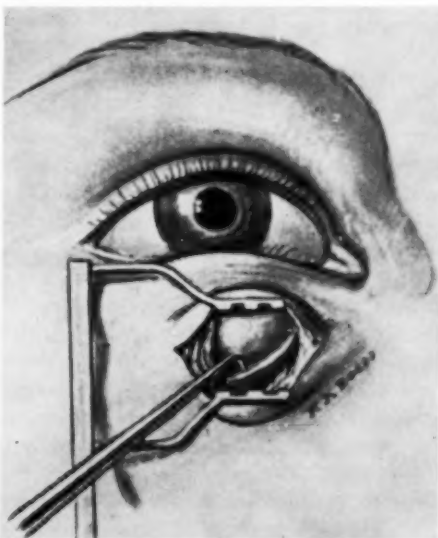


Fig. 3 (Zugsmith). Second step in skin incision technique (Dunnington®).

placed through the lower lid and the episcleral tissue of the globe, and an incision 15-mm. long is then made at the bottom of the cul-de-sac and the dissection is directed toward the orbital margin. When this is completed, the muscle is picked up by using the hook in the same way as described in the skin route." With this method it was noted there was more orbital tissue disturbed and more fat and fascia present with the muscle. There is slightly more reaction than with the skin incision.

Wiener¹⁴ described a modification in which the incision is made at the nasal half of the conjunctival cul-de-sac, deep down until it strikes the periosteum of the inferior orbital wall. A hook is introduced with the point to the temporal side of the incision, pressure is exerted so as to make the point rest on the periosteal surface of the inferior orbital wall, and the hook drawn nasally as far as it can be pulled. It has then reached the attachment of the inferior oblique which can be lifted into the conjunctival opening.

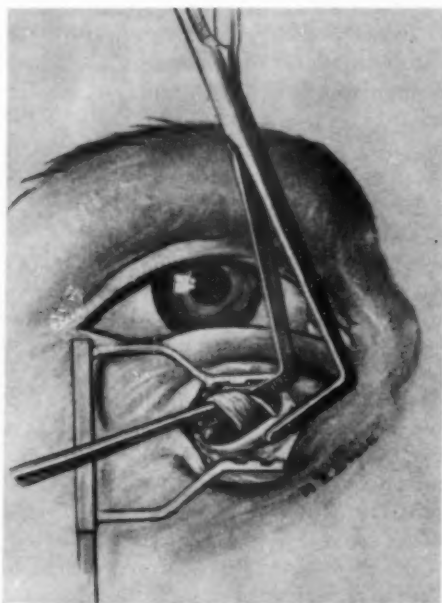


Fig. 4 (Zugsmith). Third step in skin incision technique (Dunnington³).

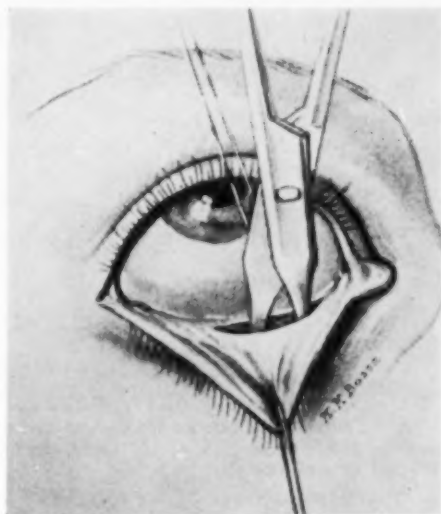


Fig. 5 (Zugsmith). Conjunctival approach to the inferior oblique muscle (Dunnington³).

The posterior route was described and recommended by Dunnington for those cases where the external rectus is also to be operated. It was achieved, "By first exposing the external rectus in the usual manner, clamping it with the muscle forceps, and completely severing it; then with the tendon reflected temporally, and the eye rotated sharply inward, a strabismus hook is passed under the inferior oblique and it is com-

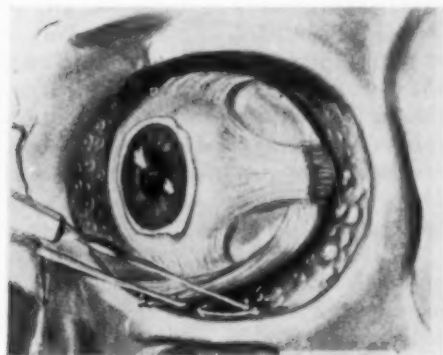


Fig. 6 (Zugsmith). Wiener's modification of the conjunctival approach to the inferior oblique muscle (Wiener¹⁴).

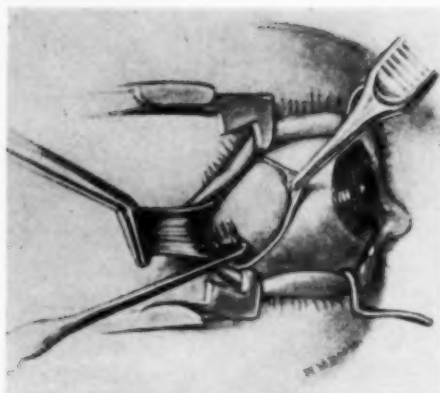


Fig. 7 (Zugsmith). Posterior approach to the inferior oblique muscle, showing the medial rectus detached (Dunnington¹³).

pletely severed close to its attachment to the sclera." In these cases he did not find it necessary to excise a portion of the muscle.

The posterior approach used by most of the operators who favor retroplacement of the inferior oblique is essentially the same as this one described in 1929.

White¹⁵ described recession of the inferior oblique, and stated that he had been doing such an operation since 1936. He promulgated this procedure because he felt, "A myomectomy at the origin of the inferior oblique, and a complete tenotomy at or near the insertion of this muscle gave about the same results when a complete paralysis is desired." He further stated, that: "With a unilateral hyperphoria or hypertropia over 15 prism diopters increasing definitely in the field of the paretic superior rectus, a tenotomy or myomectomy at the origin is still very satisfactory, but when there is less than 15 prism diopters the results are not uniform and overcorrections result."

In his discussion of White's paper, Dunnington¹⁶ disagrees with the thought that a myomectomy at the origin, and a tenotomy at the insertion of the inferior oblique produced the same result. He stated that the failure may be accounted for by the fascial bands which connect this muscle with the in-

ferior rectus. The cut end, Dunnington felt, becomes adherent at this point, thereby preserving some of the action of the muscle. Concerning retroplacement, Dunnington stated that he reserved it for cases in which the lateral rectus had to be operated on at the same time. Nor is there a unanimity of results achieved by recession or retroplacement of the inferior oblique.

Payne⁸ states, "For each millimeter of recession of the inferior oblique approximately 2.5 prism diopters of correction was attained."

Berens, et al.,¹⁷ reviewed results in 97 operations of retroplacement of the inferior oblique. He concludes that, "Approximately two prism diopters of correction is obtained in the field of action of the inferior oblique for one mm. of retroplacement. Any profuse bleeding and traumatization will make the outcome much less predictable, due to resulting adhesions."

Actual results contain the word "approximately" too often to advocate a procedure which involves disturbing intimate anatomic relationship with vulnerable structures as noted earlier. The operation of retroplacement as usually described could consume an hour or more, and would necessitate the removal of sutures closing the conjunctiva, as do all of the other approaches to the inferior oblique.

Failure of older techniques was felt to be due to: (1) Disturbance of tissue when large amounts of fat and fascia are dredged up with the inferior oblique muscle; (2) occasional inability to isolate the inferior oblique properly; (3) inability to tell whether check ligaments or attachments to the inferior rectus or lateral rectus are present; (4) hemorrhage and resultant scar formation from disturbance of Tenon's capsule, with occasional poor results from muscle ends being caught in the scar.

It was reasoned that a peritomy incision, such as is performed in preparing a flap for cataract surgery, is occasionally left without sutures, and that a minimum of disturbance

to Tenon's capsule would be produced. An operation was devised in which a partial peritomy is done.

Tenon's capsule is then dissected away from the globe with the conjunctiva. A muscle hook is passed under the inferior rectus which is brought into view; this is held for traction and subsequent inspection. Under direct observation the inferior oblique muscle can be picked up with a muscle hook, with no fat or fascia, at the middle of the muscle. Any attachments to the inferior rectus or lateral rectus can be freed under direct view. A tenotomy or myomectomy can then be performed with a minimum of trauma or a tenotomy controlled by sutures as shown by Paton¹⁸ on the superior oblique.

This is performed by placing a suture between a pair of Berens clamps. A measured amount of correction can be obtained for small amounts of hypertropia and the results can be related to each other. The inferior rectus is then released and the conjunctiva with Tenon's capsule attached is brought to the limbus, held for a moment with an applicator stick, and the eye dressed

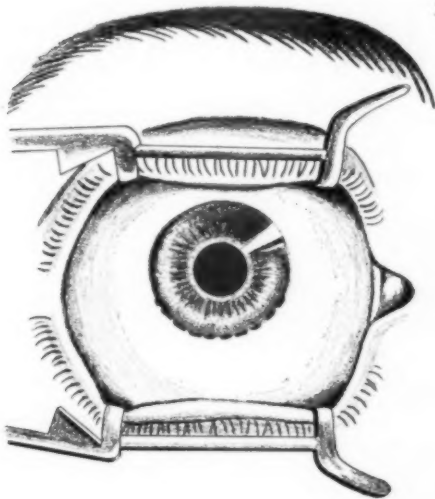


Fig. 7A (Zugsmith). Extent of the peritomy incision in the simplified approach to the inferior oblique muscle.

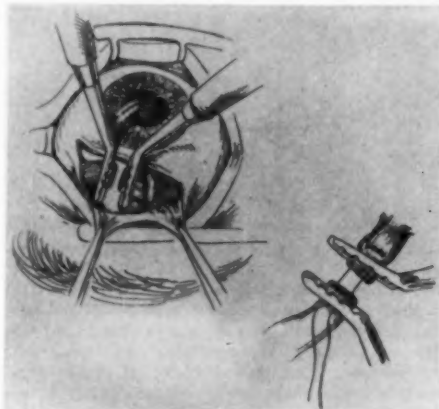


Fig. 8 (Zugsmith). Controlled tenotomy (Paton¹⁸).

without sutures. The entire operation does not take 15 minutes. The next morning all dressings are removed and the patient can be discharged from the hospital. At this time the conjunctiva is seen to be firmly attached, and, usually, no hemorrhage is present. Results with this procedure have been so uniformly satisfactory that a longer, more involved, and potentially dangerous operation is avoided.

Certain criteria are to be recommended. The most important is the routine prior to operation, as recommended by Payne:⁶ (1) History, general and ophthalmic; (2) visual acuity and accommodation, determination without and with glasses; (3) muscle balance and fusion tests; (4) refraction and correction with proper glasses; (5) orthoptics.

The orthoptics should be continued long enough for any anomalous retinal correspondence to be broken up, and Grade II fusion be obtained if possible. After surgery orthoptics should be continued for six to 12 weeks in order to insure a good functional result.

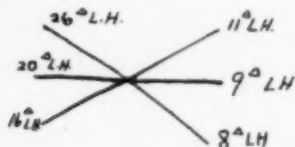
ILLUSTRATIVE CASES

CASE 1

J. W., aged 14 years. Left eye has turned up since the age of four years. Previous surgery elsewhere—myotomy of inferior oblique.

Refraction: R.E., +0.25D.; L.E., +4.0D.

Cover test: LHT—18 prism diopters; LHT'—19 prism diopters.



Fixation, right eye; suppression, left eye. Grade I fusion with large picture slides. Diagnosis: overaction of left inferior oblique; paresis of left superior oblique.

Because of the previous operation's poor result and probable scar tissue, a new approach was deemed necessary. Through peritomy incision the inferior oblique was found intact and 10-mm. myectomy performed.

Postoperative:



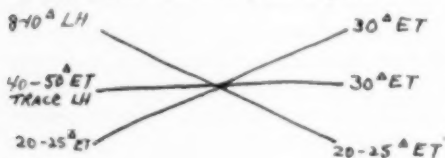
The patient was cosmetically improved.

CASE 2

R. Z., aged two and one-half years. Left eye turns in and up since the age of six months. No previous surgery. Familial history of esotropia.

Refraction: R.E., +1.75D.; L.E., +1.75D.

Cover test: 30 to 40 prism diopters esotropia and left hypertropia eight to 12 prism diopters.

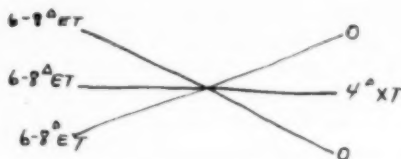


Fixation right eye. No fusion. Anomalous retinal correspondence left eye. Diagnosis: Overaction left inferior oblique; overaction right and left medial rectus. Intensive orthoptics for eight months produced normal correspondence and Grade II fusion.

Operation was tenotomy of the inferior oblique through peritomy incision of the left eye and recession of the medial rectus right eye five mm.

Postoperative orthoptics for one month.

Measurements:



Intermittent single binocular vision was present for distance and near. Fusion amplitudes not full.

CONCLUSION

1. A review of operating techniques on the inferior oblique shows little difference in the last 30 years.

2. A short anatomic review notes the important structures adjacent to the inferior oblique insertion.

3. A simple approach to the muscle which eliminates injury to adjacent and neighboring structures is presented.

4. Functional results are believed to be comparable to those following more involved and complicated procedures. Two cases are presented.

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CORNEAL AND AUDITORY FINDINGS IN BOECK'S SARCOID*

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It is the purpose of this paper to report two cases of proven Boeck's sarcoid similar in that they had distinctive anterior segment pathology, the nature of which was proven pathologically. One patient, in addition, exhibited profound vestibulo-auditory disease. This association of uveitis and what is undoubtedly a manifestation of sarcoid of the meninges, nerves, or brainstem brings up the clinical significance of sarcoid in cases of uveoencephalitis. There are in sarcoid definitive pathologic changes with which to establish a diagnosis and in such cases the disease should be excluded to the best of one's ability.

CASE REPORTS

CASE 1

A 25-year-old Negro was admitted to Wills Eye Hospital, service of Dr. Irving H. Leopold, through the courtesy of Dr. William Zimmerman of Roanoke, Virginia. He had recurrent pain and redness of the eyes for eight years with gradual loss of vision, right greater than left.

Physical examination showed enlarged epitrochlear, axillary, supraclavicular, and inguinal lymph nodes. Chest X-ray studies showed hilar enlargement suggestive of sarcoid. X-ray films of the hands revealed marked punched-out rarefaction of the phalanges (fig. 1). X-ray examination of the orbit showed calcification of the lens on the right (fig. 2), an unusual finding in itself. Total protein was 7.4 percent, AG ratio 1:3. Biopsy of an epitrochlear lymph node revealed typical sarcoid (fig. 3).

Eye examination showed vision to be: O.D., light perception with good projection; O.S., 5/60, pinhole, 6/21. The right cornea was opaque due to a white porcelainlike membrane over its entire posterior corneal surface. In addition, some calcific flakes were noted in the corneal stroma centrally (fig. 4). The left eye showed a similar porcelain membrane extending over the lower third to half of

the corneal endothelial surface. The anterior chamber was normal otherwise.

Corneal transplant with cataract extraction and iridectomy was performed on the right eye. The visual results of this procedure were not good but the patient still maintained hand movements, a slight improvement over preoperative vision. Of interest is the pathologic findings on the cornea which included dystrophic changes in the stroma. A clear hyaline membrane previously opposed to the endothelial surface of the cornea adhered to the atrophic iris during surgery (fig. 5).

CASE 2

A 13-year-old Negro boy was admitted to the Wills Eye Hospital, service of Dr. Irving H. Leopold, complaining of poor vision and deafness. Seven months before admission he developed a high fever, nausea, vomiting, headache, and general malaise. Fever and general malaise persisted for 36 hours at which time he noted bilateral impairment of hearing. Deafness was almost complete at the time of admission. Three months prior to admission he had another bout of fever, nausea, and vomiting at which time a diagnosis of viral infection was made and the patient received penicillin injections for 10 days. During this time he developed gradual impair-

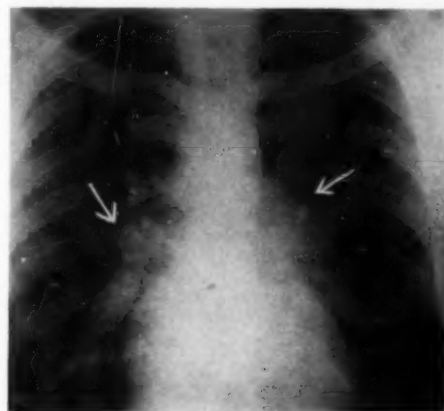


Fig. 1A (Hedges and Cardoso de Melo). Enlarged hilar lymph nodes commonly seen in sarcoid.

* From the Wills Eye Hospital.

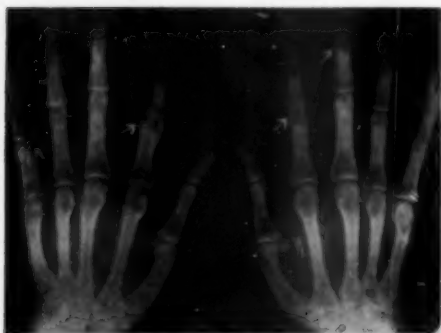


Fig. 1B (Hedges and Cardoso de Melo). Punched-out rarefaction of the phalanges commonly seen in sarcoid.

ment of vision bilaterally with redness and pain. Diminution of visual acuity increased gradually to the time of admission.

Physical examination showed enlarged cervical lymph nodes. There was bilateral loss of hearing. Both air and bone conduction were deficient on both sides with the loss of bone conduction greater than air conduction.

Eye examination revealed vision to be: O.D., 6/6; O.S., 6/60. Tension: O.D., 41 mm. Hg; O.S., 46 mm. Hg; hazy corneas due to edema, mutton-fat keratic precipitates, two-plus flare in the anterior chamber, posterior synechias, O.D., early lens changes (right greater than left) and a porcelain-white membrane coming up from the inferior limbus lying against the corneal endothelium (fig. 6).

Course in the hospital. A diagnosis of Boeck's

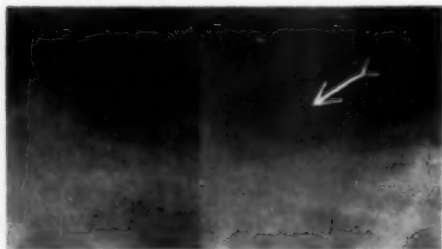


Fig. 2 (Hedges and Cardoso de Melo). Calcification of the lens seen by X-ray examination of the right orbit, using the Sweet method.

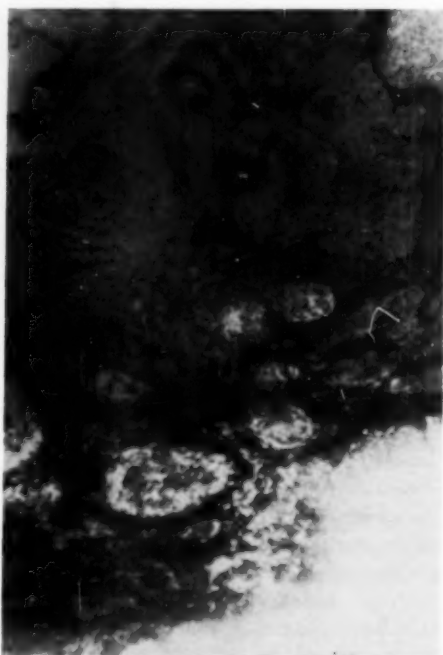


Fig. 3A (Hedges and Cardoso de Melo). Microscopic view of biopsy of lymph node, showing granulomatous lesion with giants cells, lymphocytes, and epithelioid cells.

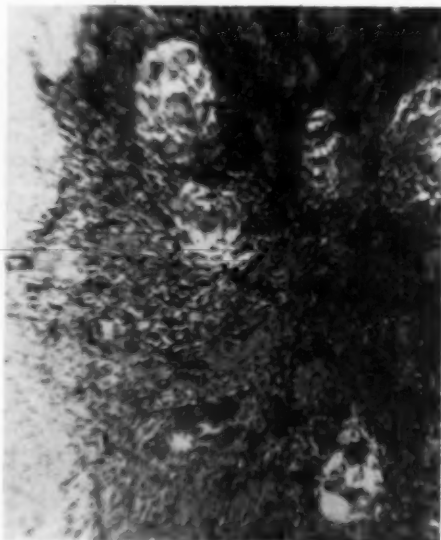


Fig. 3B (Hedges and Cardoso de Melo). Magnification of Figure 3A.



Fig. 4A (Hedges and Cardoso de Melo). Full-face view, showing gross corneal changes.

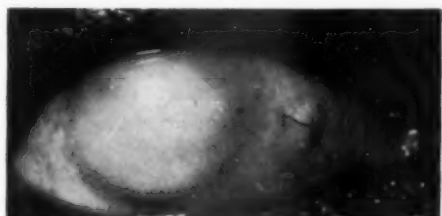


Fig. 4B (Hedges and Cardoso de Melo). Right eye, showing preoperative picture of porcelain-white membrane against the surface of the cornea.

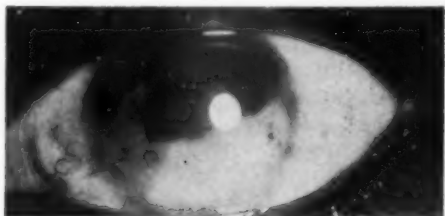


Fig. 4C (Hedges and Cardoso de Melo). Left eye, showing incomplete corneal membrane with well-defined border.

sarcoid was established by lymph-node biopsy. No other positive findings were noted on thorough uveitis survey except a positive stool for *Ascaris lumbricoides*. Spinal fluid and electroencephalogram were normal.

Treatment with local mydriatics and steroids plus systemic Diamox, steroids, and hydroxychloroquine have been only partially successful in controlling the smoldering uveitis and secondary glaucoma. A dense, complicated cataract reduced vision to light perception on the right and marked vitreous haze persisted, O.S., with tension varying widely from 7.0 to 70 mm. Hg.

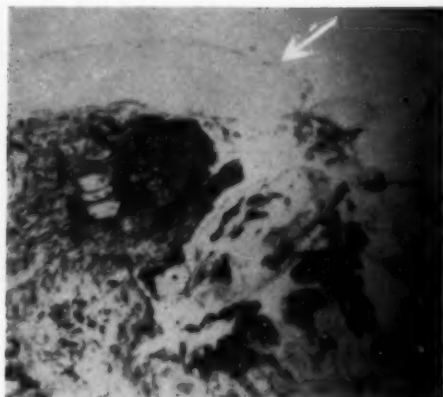


Fig. 5 (Hedges and Cardoso de Melo). Organized exudate adherent to atrophic iris which had previously been apposed to the posterior corneal surface of the right eye (fig. 4B).

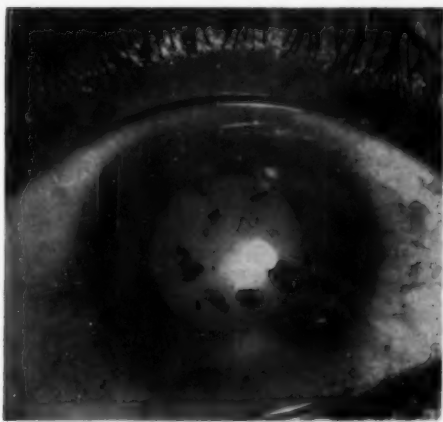


Fig. 6A (Hedges and Cardoso de Melo). Right eye, showing membrane at inferior limbus against the posterior surface of the cornea, posterior synechias of the iris, and a mature cataract.

DISCUSSION

The protean manifestations of Boeck's sarcoid in all systems of the body are well known. Ocular and central nervous system involvement are of concern to the ophthalmologist. The ocular manifestations of granulomatous uveitis, most commonly involving the anterior segment, are not particularly characteristic. In the two cases re-



Fig. 6B (Hedges and Cardoso de Melo). Left eye, showing early posterior corneal change inferiorly.

ported, the porcelain-white membranes on the posterior corneal surface were striking enough to make Boeck's sarcoid the most likely diagnosis in the second patient, once we had uncovered the diagnosis in the first case. However, it seems logical to assume that such a pathologic change could occur in any form of chronic uveitis involving the anterior segment, since an exudate, transudate, or fibrovascular membrane formed during a more acute phase of the disease could become hyalinized after a period of time and produce this clinical picture. Therefore, one would certainly not describe this as a distinctive change in sarcoid alone. It is of interest, however, that these are the only cases we could uncover in the literature with this finding and that they occurred in sarcoid in each instance.

One patient showed profound involvement of the vestibulo-auditory system, one of the many and varied neurologic manifestations possible with systemic sarcoidosis and uveo-encephalitis. This subject¹⁻⁸ most commonly considered under Harada or Vogt-Koyanagi disease has not included any mention of sarcoid as a possible etiology to date. Cowper,¹ in 1951, presented an excellent re-

view of the subject. He proposed the term uveoencephalitis believing that Harada and Vogt-Koyanagi disease should not be considered as separate entities. Colover⁹ reported three cases plus 118 patients in the literature reported to 1949 of central nervous system involvement due to sarcoid but no case had uveitis. In his series, nerve deafness occurred in eight and vestibular symptoms in one patient. In 1952, Hedges and Taylor¹⁰ reported a patient with acute vestibulo-auditory symptoms, that is, tinnitus and vertigo, followed by deafness in association with chronic smoldering bilateral uveitis due to proven sarcoid. No corneal changes were present in this case.

The patient herein reported therefore represents associated ocular and vestibulo-auditory findings and, although adding nothing new to the literature, incorporates the posterior corneal changes ascribed to the long-standing granulomatous inflammation.

A recent report of Cogan's syndrome or avascular interstitial keratitis and vestibulo-auditory symptoms¹¹ mentions the case with sarcoid¹⁰ reported above. It should be re-emphasized that the case observed here certainly does not have the prerequisites for this clinical syndrome. It could be suggested, however, that sarcoid be ruled out in cases of Cogan's syndrome.

SUMMARY

Two cases are reported of proven sarcoidosis, presenting unusual posterior corneal opacification, chronic uveitis, and, in one, severe auditory symptoms resulting in deafness. Pathologic material of the cornea and iris is presented to illustrate the characteristics of the hyaline membrane on the posterior corneal surface. Patients with chronic granulomatous uveitis who present the anterior segment pathology described and/or meningoencephalitic involvement, particularly of a vestibulo-auditory type, should have sarcoid ruled out as a possible etiology.

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THE USE OF THE VISUSCOPE

FOR MAPPING A "FIELD" OF RETINAL FUNCTION

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The Visuscope (Oculus)* is a modified ophthalmoscope designed with a cross of foveal size (about one degree) so placed in its optical system that it is clearly projected on the retina when the fundus is brought into focus. The cross is primarily intended for use as a fixation target in the study of eccentric fixation but, in addition to its original purpose, I have found it most useful as a direct method of determining the function of a given retinal area.

The cross is simply moved over the fundus and the patient is asked to state where he sees it and where he does not. He must be sure that he really distinguishes the outline of the cross; if he reports impressions of movement or shadows, errors are introduced by such factors as entoptic phenomena and vitreous floaters and the results may be unreliable. But if the patient is cautioned to look for the actual shape of the cross, very consistent answers can be obtained. To avoid undesirable dazzling effects, the light should be

kept at the minimum intensity adequate for a clear view of the fundus.

The location and size of scotomas are estimated in terms of multiples (or fractions) of the Visuscope aperture which is seven degrees in diameter. Thus, for example, if the fixation cross is lost by the patient when the edge of the circle of light projected onto the retina just touches the fovea, the margin of the scotoma is located 3.5 degrees from the center of the field. In the region of the posterior pole, localization to within about one degree (one third of the radius of the Visuscope aperture) is quite easy because the fovea and the disc can be used as points of reference but, in the periphery, where landmarks are not so readily available, the estimates are more approximate. However, when visible lesions are present, they can be used for orientation and any neighboring peripheral scotomas can then be defined as accurately as central ones.

If even more exact figures are required, the measuring grid of the Visuscope, which is calibrated in squares of 14 minutes, may be used. As a rule, however, in the type of case in which the Visuscope method is most

* All figures in this paper refer to the old model of the Visuscope. The new model has a fixation cross 40 minutes in diameter, a total aperture about five degrees in diameter, and measuring grids proportionately reduced in size.

applicable, such precision is superfluous; the grid is of no advantage, and its use adds a good deal of unnecessary difficulty to the technique.

The directional configuration of the Visuscope "field" will, of course, correspond to that of the retina as seen by the examiner and will be the reverse of the conventional field map. That is, a defect located nasally and above by the Visuscope would be placed temporally and below by perimetry.

Quantitative variations of the field cannot be studied by the Visuscope method. According to the manufacturer, the fixation cross is one degree 10 minutes from point to point, or approximately equivalent in size to a 20-mm. object at a distance of one meter. Since the patient must see the separation between the arms of the cross in order to identify its form, the angular acuity required to recognize the cross as such is somewhat better than its one-degree size might imply. Nevertheless, it is considerably larger than the objects most frequently used in perimetry, and the very intense illumination and contrast make it a much stronger visual stimulus than the ordinary target of comparable size. Thus, only very dense scotomas can be detected by the Visuscope and the regions where the cross disappears represent very nearly (although not quite) absolute field defects.

In these areas some light sense may still be present, and the pinhole light of an ophthalmoscope may be perceived where the Visuscope cross can no longer be identified. However, a number of attempts showed that it is not feasible to substitute the ophthalmoscope light for the Visuscope target. With the rest of the fundus dark, orientation is too difficult for the examiner and, perhaps as the result of reflections or after-images, patients seem quite uncertain as to exactly when the light passes from a seeing to a nonseeing area. For reasonably consistent results, I have found it essential to insist that the patient distinguish the shape of the target and this is obviously impossible if a circle of light is used.

The Visuscope method of field study is

limited to grossly qualitative observations and it is in no sense suggested as a substitute for conventional perimetry but rather as a supplementary technique which can be used to good advantage under certain special circumstances. In some otherwise difficult situations where ordinary perimetry may be unsatisfactory, it provides a remarkably quick and easy way to evaluate the general configuration of the field.

It is particularly useful where macular pathology makes fixation impossible, or where small but deep scotomas are suspected in the presence of very poor acuity. Where irregular elevations of the detached retina create marked errors of refraction varying from place to place, it is no problem to refocus the fixation cross upon each point of interest in turn and in this way to test its function directly and specifically without complications from optical distortions.

In general the Visuscope technique, which permits the simultaneous evaluation of structural changes and functional loss, is most useful for the correlation of scotomas with visible fundus pathologic changes and least suitable for outlining the peripheral field.

Since the purpose of the method and the kind of information it yields are quite different from those of the classical techniques of perimetry, a direct comparison of the two approaches is not valid. However, the following cases are described briefly as examples of the kind of situation where the Visuscope "field" can be especially helpful, while perimetry is of relatively limited value.

CASE REPORTS

CASE 1

Miss A. E., aged 20 years, had an extensive retinal detachment involving the temporal and inferior retina as well as the posterior pole of the right eye. There was a disinsertion at the temporal periphery and a macular hole. Visual acuity was reduced to about 20/300 with eccentric fixation. Visual fields were plotted on the tangent screen at 750 mm. with the patient fixing on her finger. The 20-mm. white target showed superior constriction to about 15 or 20 degrees, and a central scotoma about 10 degrees in diameter. The physiologic blind-spot could not be outlined. With a two-mm. target

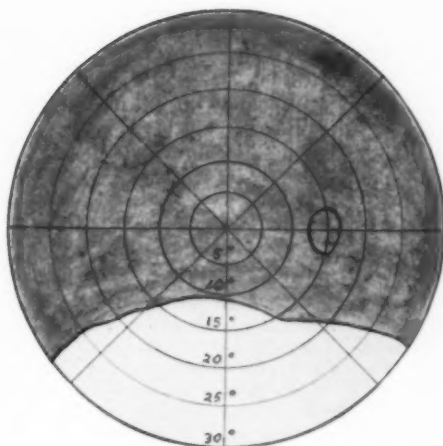


Fig. 1A (Meyers). *Case 1.* Preoperative central field, right eye, on the tangent screen. Two-mm. and 20-mm. white objects at 750 mm. Islands of vision were noted to be present superiorly but could not be plotted. Fixation was very poor and the area of vision could be outlined only approximately.

there was an area of vision approximately between 10 degrees and 35 degrees inferiorly and extending to within about 20 degrees of the horizontal meridian on the temporal side. Fixation was very unreliable, and all the isopters were variable.

The last preoperative field, taken a month later, was even more unsatisfactory. Fixation had become worse, and the field showed only a vague oval of vision from about 10 degrees below the center and extending inferiorly to about 20 degrees, 30 degrees, and 40 degrees, with the one-mm., two-mm., and 20-mm. objects respectively (fig. 1A). There seemed to be some islands of vision superiorly, but these were too elusive to plot. An unsteady angle of exotropia made stereocampimetry of little help. The patient gave a history of right esotropia in childhood, and it is possible that the lack of previously established binocular stability made it particularly difficult for her to control her fixation when central vision was lost.

Reattachment of the retina was accomplished by scleral buckling and diathermy. During the postoperative course there was edema and narrowing of the vessels in the superior temporal quadrant and a vascular occlusion in this sector was suspected. Several months later the retina appeared flat and well in place, with atrophy and pigmented scars in the peripheral treatment areas and around the macula. There was also a roughly circular area of atrophy about four or five degrees in diameter under the superior temporal vessels just beyond the disc but more distally this sector of the retina appeared essentially normal.

Fixation was now so poor that it was altogether

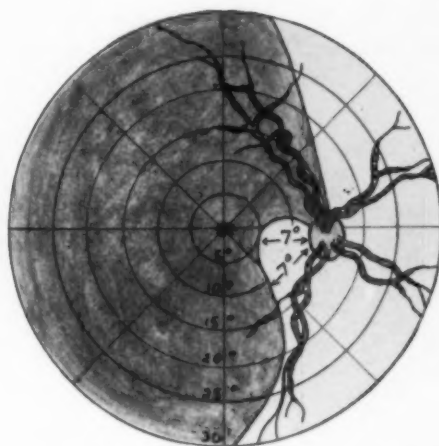


Fig. 1B (Meyers). *Case 1.* Diagrammatic sketch of the Visuscope "field" of the right eye, postoperatively (no attempt has been made to show the actual appearance of the fundus).

impossible to obtain a meaningful field by perimetry. However, the patient felt that she could see best in the temporal region, and a gross confrontation field seemed to confirm her subjective impression.

A Visuscope survey of retinal function was then carried out. In this way the "field" was plotted in only a few minutes, and in contrast to the usual procedures which she had found extremely irksome and frustrating, the patient remarked that this examination was "fun." Her answers were perfectly consistent, and the cross passed abruptly and definitely from a seeing to a nonseeing area at the same place on the retina each time. The cross was visible within about seven degrees of the temporal side of the disc and disappeared beyond this point. There was no vision in the entire sector supplied by the superior temporal vessels to about the 105 or 110 degree meridian, including the distal portion of this quadrant which had a grossly normal appearance (fig. 1B).

COMMENT

This case was selected as an example because it illustrates especially well the striking contrast between the speed and simplicity of the Visuscope method and the difficulties of perimetry in a situation of this kind. The plotting of the field in the usual way was extremely time-consuming and tedious, and produced little information that was not already apparent from the patient's own impressions or from the appearance of the

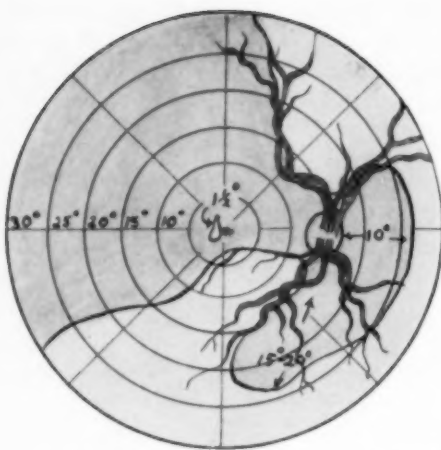


Fig. 2 (Meyers). Case 2 Diagrammatic sketch of the Visuscope "field" of the right eye. There is a small island of vision just temporal to the fovea. The patient's fixation and comprehension were so poor that no visual field could be plotted on the tangent screen.

fundus. The Visuscope, on the other hand, rapidly established the general configuration of the field as well as its relationship to the visible lesions of the retina, and demonstrated particularly well the superior temporal sector defect which had been suspected on the basis of the presumed vascular occlusion.

The greatest limitation of the Visuscope method in a case like this one is the difficulty of localization outside the region of the posterior pole. Since the Visuscope illuminates only a seven-degree circle of the fundus at one time, the position of a scotoma must necessarily be defined with reference to landmarks no further than about seven degrees from its borders, and such landmarks may be lacking in the periphery. The problem could be obviated by combining a fixation cross with a much larger aperture (perhaps 30 degrees) and a measuring grid calibrated in squares of one or two degrees, and, if such an instrument were available, the Visuscope technique of field study would be even more satisfactory.

CASE 2

Mrs. D. H., a 75-year-old widow, had a loss of

vision in the right eye for about one year. Examination showed vascular sclerosis and bilateral choroidal atrophy especially around the discs. On the right there were numerous fairly large, blotlike hemorrhages in the region of the posterior pole but not directly overlying the macula, which showed no gross evidence of pathology except for a diminished foveal light reflex. The best corrected vision was 2/200 on the right and 20/25 on the left. An attempt was made to plot the fields on the tangent screen but, because of inadequate acuity and unsteady fixation, further complicated by the patient's poor comprehension of the procedure, no result at all could be obtained on the right eye. On the left, a rather unreliable field was outlined, showing roughly symmetrical constriction to about 20 degrees and 15 degrees with the three-mm. and the two-mm. white targets respectively. The blindspot appeared to be of approximately normal size.

Both eyes were examined by the Visuscope method. Unlike Miss A. E., this patient had considerable difficulty understanding the instructions, and tended to move her eye in search of the cross. However, with persistent effort and repeated explanations, consistent results were finally achieved. The right Visuscope "field" is shown in Figure 2. A circumpapillary defect extended about 10 degrees nasally, 15 to 20 degrees below, and less than five degrees above the disc and there was no vision in the superior temporal quadrant as far peripherally as it was examined. Just temporal to the visible fovea there was a tiny island of vision about 1.5 degrees in its greatest dimension. The left eye also showed a definite circumpapillary scotoma essentially similar in size and shape to the one on the right, except on the temporal side, where it terminated about 10 degrees beyond the disc, sparing the macula, and not involving the superior temporal retina.

COMMENT

In this case, perimetry contributed no information at all about the right eye; the equivocal field on the left seemed to show only nonspecific general constriction. In contrast, the Visuscope method gave reasonably consistent and significant findings in spite of the patient's difficulty in comprehension. Visuscope "fields" demonstrated the extensive defects not only in the right eye, but also comparable changes on the left, suggesting that the loss of vision on the right was the outcome of a bilateral process which had progressed further on this side than on the other. This is an example of a situation where Visuscope examination provided clinically significant information that could not

be obtained by other methods. The island of vision temporal to the right fovea was probably of little practical importance, but it is interesting how easily so small an area could be found and measured by the Visuscope technique.

SUMMARY

The use of the Visuscope for mapping a "field" of retinal function is described. This method is suggested as a supplement to conventional perimetry particularly for the di-

rect correlation of functional loss with visible lesions, and for use in situations where unsteady fixation is a problem. Two cases are briefly presented to illustrate the use of this technique.

13 Walnut Road.

ACKNOWLEDGMENT

The two cases described were private patients of Dr. Conrad Berens and were examined in his office. I wish to acknowledge with gratitude his permission to present this material and to thank him for his critical reading of this paper.

OPHTHALMIC MINIATURE

UPON COMPLETION OF A COURSE ON STRABISMUS

Dr. Mario X. Landó

Unhappy me! When I was ignorant

of this complication of strabismus
I lived satisfied with myself
and at times—unconsciously—I operated upon it.

But as I expected, science arrived,
Phoria and antagonism came
and I noted in the middle of the cataclysm
all my knowledge tumbled.

From such sagaciousness I made a collection
that to remember it, is already martyrdom,
for which reason and without thinking of my pride
and fearing an attack of delirium
I leave the "sinotoscope" to the sage
and I return to the use of unguent and cholirium.

(Translated by Ramón Castroviejo)

Revista oto-neuro-oftalm. y de cir. neurologicala, 1958.

NOTES, CASES, INSTRUMENTS

PHACOGENIC GLAUCOMA*

BUDD APPLETON, CAPT. (MC) U.S.A.

AND

AUSTIN LOWREY, JR., COL. (MC) U.S.A.
Washington, D.C.

Ophthalmology, probably because of the influence of the European schools, has always been recognized as a specialty in which descriptions have been most precise and terminology most rational. Because of this traditional attention to correct terminology, ophthalmologists are seldom faced with paradoxes. Occasionally, however, confusion is encountered, and if this pertains to important clinical conditions, the terminology should be clarified immediately, otherwise confusion of terms may result in confusion of knowledge.

One field in which there has recently been some confusion is that of glaucoma produced by the lens. Because of the recent advances in diagnostic, pathologic, and therapeutic approaches to this problem, several articles in which there has been some confusion in terminology have appeared in the recent literature.

For purposes of discussion, both clinical and pathologic, the following classification has been suggested at Walter Reed Army Hospital. Each term is used to identify an already well-described clinical entity, and no new knowledge is introduced here. The purpose of this report is simply to separate and identify the types of lens-induced glaucoma.

Phacogenic glaucoma (phacos, lens; genesis, creation) covers the entire group of entities having as a common aspect a glaucoma which is in some way produced by the lens.

1. *Phacolytic glaucoma* (phacos, lens; lysis, loosing) is the glaucoma which ensues when a lens, usually because of hyperma-

turity, develops increased permeability or a defect in its capsule, and cortical material is allowed to escape into the aqueous. This cortex is engulfed by macrophages which then accumulate, either by migration or by aqueous current, in the angle of the anterior chamber and physically block the outflow of aqueous humor by clogging the trabecular meshwork. Morphologically, this is an "open-angle" or "wide-angle" type of glaucoma.

2. *Phacotopic glaucoma* (phacos, lens; topos, place) results when the lens is displaced. This has been recorded in both anterior and posterior subluxation, and while the pathogenesis, in some instances, is a purely physical obstruction of the chamber angle, in others the angle appears open, and the mechanism is poorly understood.

3. *Phacomorphic glaucoma* (phacos, lens; morphos, form) is produced by abnormal lens size, lens shape, or both. In this class, the type known as malignant glaucoma is found. This type has received considerable attention in the recent literature, and, as Chandler points out, is probably the result of the lens being relatively excessive in size with respect to the size of the rest of the anterior segment, thus creating a strong disposition to an attack of narrow-angle glaucoma due to any of several precipitating causes. Other examples of phacomorphic glaucoma are those associated with lenticonus and with spherophakia.

4. *Capsular glaucoma* (glaucoma capsulare). Many examples of "ordinary" narrow-angle glaucoma occur in patients who also show what appears to be an exfoliation of the lens capsule, and recent evidence indicates that the exfoliative process is not necessarily related to the associated glaucoma. In other cases, however, particularly in those reported by Theobald under the heading of "pseudoexfoliation" of the lens capsule, an open angle with actual histologic evidence of trabecular blockage by particulate matter is noted. This same particulate matter is noted

* From the Ophthalmology Service, Walter Reed Army Hospital, Walter Reed Army Medical Center.

on the lens capsule in these patients, although it may not originate there. Until a more adequate explanation can be offered for these findings, one must accept *glaucoma capsulare* as an entity, with the lens as a possible etiologic agent.

There are several other instances of glaucoma associated with abnormalities of the lens, such as in congenital cataracts with aniridia, but these cannot be interpreted as being caused by the lens. Furthermore, one cannot consider as directly phacogenic those cases of glaucoma which occur as secondary complications to lens-induced inflammations, as in phacotoxic or phacoanaphylactic endophthalmitis.

SUMMARY

The terminology of lens-induced glaucoma is reviewed.

Phacogenic glaucoma is the generic term for the entire group of lens-induced glaucomas. These are enumerated and identified by names based on the specific processes involved—*phacolytic glaucoma*, *phacotopic glaucoma*, *phacomorphic glaucoma*, and *capsular glaucoma*.

Walter Reed Army Hospital (12).

NEVOXANTHOENDOTHELIOMA

OF THE EYE TREATED WITH SUPERFICIAL X-RAY THERAPY

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Since the original description of nevoxanthoendothelioma involving the eye, by Blank, Eglick, and Beerman,¹ reports of ocular involvement with this disease have appeared sporadically in the literature.

The disease is a xanthomatous process seen in infants or children, usually accompanied by skin lesions. When the eye is involved, there is a granuloma of the iris usually, although recently involvement of epibulbar tissues has been reported.² The characteristic occurrence of spontaneous anterior chamber hemorrhage has been stressed by



Fig. 1 (Hedges). Nevoxanthoendothelioma of the lower right portion of the iris seen hazily through the steamy cornea.

Maumenee.³ Elevation of intraocular pressure has been usual and, in some instances, has led to surgical intervention.⁴

The present report concerns a case of clinically suspected nevoxanthoendothelioma treated successfully with superficial X-ray therapy.

CASE REPORT

A three-month-old white infant, a boy (T. J.), was first seen on April 12, 1958, with a three-day history of redness and epiphora of the right eye. The child had been healthy except for the presence of congenital inguinal hernia and undescended testicle. Ex-

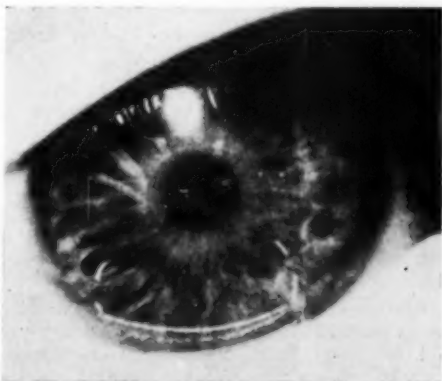


Fig. 2 (Hedges). Complete regression of the lesion three months after superficial X-ray therapy.

amination of the right eye revealed moderate conjunctival injection, a steamy cornea, and several large confluent iris lesions of granulomatous appearance inferiorly. The intraocular pressure was 46 mm. Hg (Schiøtz). The fundus was normal. There were no skin lesions. Four days later anterior hemorrhage was noted.

The patient was seen at the University of California Eye Clinic in San Francisco where it was felt that the diagnosis was ocular neovoxanthoendothelioma. X-ray therapy was recommended.

The patient was given a course of eight superficial X-ray treatments using 100 kv., 15 ma. technique at 24.5 cm. TSD with a HVL of 3.0 mm. Al. Each daily treatment was 50 r (air dose) for a total of 400 r

(air dose) extending over a 10-day period.*

Three days after treatment was completed, the granulomatous iris lesions had disappeared completely. The tactile tension was normal. Slight corneal haze and a small corneal infiltrate cleared up in one month. The infant was examined under anesthesia two months after completion of treatment, at which time the right eye was of normal appearance, with an intraocular pressure of 20 mm. Hg (Schiøtz). Three months after treatment, the eye remains normal.

1177 Montgomery Drive.

*Treatment under supervision of John A. Pennington, M.D., and George Jaffrey, M.D., 521 Doyle Park Drive, Santa Rosa, California.

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OCCCLUSION OF THE CILIORETINAL ARTERY*

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Cilioretinal vessels are usually arteries and are usually derived from the circle of Zinn. The arteries are seen as they emerge from the deep structures on the temporal side of the disc. They curve toward the macula with a characteristically sharp loop.[†] They are present in 16.4 percent of all eyes.[‡]

The cilioretinal arteries are end-arteries. In cases of embolism or thrombosis of the central retinal artery a limited circulation in the area of the cilioretinal artery remains

intact. Frequently the only functioning retinal elements in cases of occlusion of the central retinal artery are those supplied by the cilioretinal artery. Many such cases have been reported.

I was unable to find a reported case in which there was occlusion of the cilioretinal artery while the regular retinal arterial system was uninvolved. It may be that such cases have occurred without production of symptoms. Or perhaps a cilioretinal artery has become occluded in an eye already severely damaged by arteriosclerotic changes.

The case to be reported is that of a man who developed an occlusion of a cilioretinal artery in an otherwise normal eye.

REPORT OF CASE

The patient, a 52-year-old white laborer, first reported to this office complaining of a sudden onset of blurred vision in the left eye of 48 hours' duration. The patient had

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† Duke-Elder, W. S.: *Textbook of Ophthalmology*, St. Louis, Mosby, 1938, v. 2, p. 1391.

‡ Salzman: *Arch. f. Ophthalm.* **39**:146, 1893 (quoted by Duke-Elder).



Fig. 1 (Friedman). Appearance of left eye 48 hours after onset of symptoms. The cilioretinal artery is extremely narrow and, in places, almost completely disappears. The surrounding retinal tissue is edematous.

never had ocular injury, disease, or surgery. He had worn glasses for myopia and presbyopia for three years.

The visual acuity was: R.E., 20/60; L.E., 20/40. This could be corrected to: R.E., 20/20; L.E., 20/30.

The external examination showed the eyelids, lacrimal apparatus, and surrounding structures to be normal for each eye. The conjunctiva, sclera, and cornea were normal. The iris substance was normal in each eye. The pupils were round, regular, and equal, although the pupil of the left eye reacted sluggishly to light and accommodation. Slitlamp examination was negative.

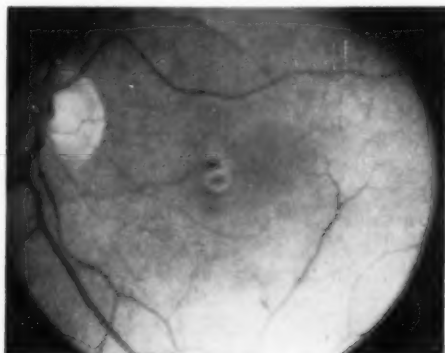


Fig. 2 (Friedman). One week after onset of symptoms.

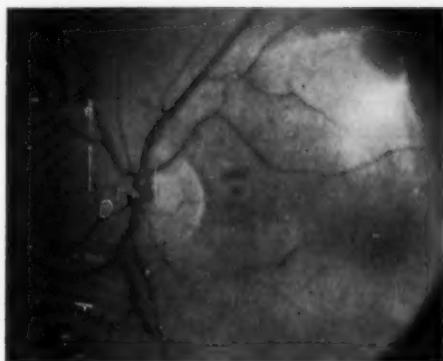


Fig. 3 (Friedman). Three weeks after onset of symptoms. The retinal edema has disappeared and the appearance of the fundus is normal.

The fundus of the right eye was normal. The fundus of the left eye showed a cilioretinal artery, extending from the disc to just below the macula, which was markedly irregular in shape and at points near the disc was invisible. The retina immediately adjacent to the cilioretinal artery was edematous, with the edema extending just up to the macula inferiorly.

The intraocular pressure of each eye was well within the normal range when measured with a Schiötz tonometer.

The visual fields of the right eye were normal. The visual fields of the left eye showed a dense paracentral scotoma to a 2/1,000 white test object.

In spite of the fact that the occlusion of the cilioretinal artery had occurred 48 hours earlier, a vasodilator (Priscoline) was prescribed.

Five days later there was marked subjective improvement. The corrected visual acuity was 20/20-1. Ophthalmoscopically, the fundus appeared unchanged. The visual field now showed an arcuate paracentral scotoma above fixation.

Three weeks after the first examination the corrected visual acuity was 20/20. Ophthalmoscopically, the edema of the retina had disappeared. The cilioretinal artery now appeared almost normal with only a few areas

of focal constriction. The visual field continued to show an arcuate paracentral scotoma above fixation.

Five weeks after the original examination, the corrected visual acuity remained at 20/20. The patient was asymptomatic. The fundus looked normal without evidence of edema or discoloration of the posterior pole. The visual field findings were now restricted to a relative paracentral arcuate scotoma above the area of fixation.

Stanford University Medical School (15).

TECHNIQUE FOR CATARACT SECTION AND SUTURE WITHOUT A TRAINED ASSISTANT

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Ocala, Florida

One 6-0 Ethicon gut suture with a single micropoint needle is soaked in a solution containing five-percent glycerine and a few

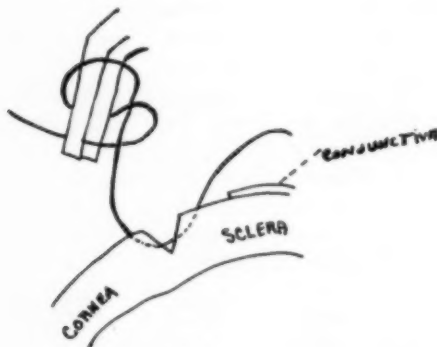


Fig. 1. (Anderson). After placing the suture through both lips of the wound enough is pulled out the corneal side in order to tie a loop knot as shown. The end of the suture is held in the fingers and suture forceps are looped around the suture grasping it as shown about seven to 10 mm. from its end. The suture is now grasped between the cornea and the forceps and the knot pulled down onto the forceps blades, then off the end onto the suture. A simple loop knot with the loop part now held by the forceps is thus created. If the knot is not almost tied as it slips off the forceps, or if the suture end extending from the forceps grasp is too short, the knot will pass off the end of the suture and no loop knot will be formed.



Fig. 2 (Anderson). The loop knot just tied is now pulled down onto the cornea by pulling out the loop in the wound as shown. Notice that the loop will stand out away from the eye and will take exactly a one-half twist.

drops of methylene blue to make it more pliable and more easily seen. After adequate anesthesia and akinesia, a peritomy is done and the limbus cleared of frayed tissue. Three scratch incisions are made at the limbus and the suture placed through each, leaving about four inches of suture at each site. A loop should be pulled out of each incision before cutting. The suture is pulled out from the corneal side far enough to tie a loop knot in the end of the suture (fig. 1). The single knot thus produced is tightened on the forceps and then slid onto the suture, creating a single loop. This knot is pulled down onto the cornea thus securing the suture. From the scleral side the suture is pulled out, leaving a small loop extending from the incision (fig. 2). This is done for each of the sutures. The loops will stand out away from the eye so as not to complicate the section.

The section is then made between two of the sutures. For enlarging the section with scissors, the suture is easily managed by having the nurse hold the extended suture against the forehead. With both ends of the suture secured, the loop extending from the incision can be held with forceps so as to place equal tension on each side of the incision. Chandler's blunt iris forceps closed inside the loop so that the suture may pass freely through the blades functions nicely in

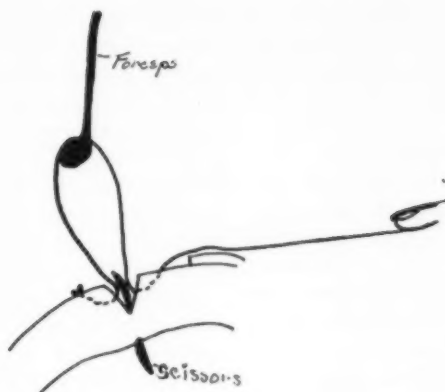


Fig. 3 (Anderson). After the section has been made, and with the loop extending seven to 10 mm. from the wound, one of the sutures adjacent to the section is tightened and secured against the forehead by the assistant's finger. The loop is then held as shown so that the half turn is removed and one blade of the scissors is placed in the loop and the other in the anterior chamber. Traction on the loop makes it almost impossible to cut the suture.

this respect. The loop must be turned a half turn in order to get its corneal and scleral sides in their proper positions. Holding it in this manner, one blade of the scissors can be easily passed through the loop with the other in the anterior chamber and the cut made without danger of cutting the suture (fig. 3). The cornea can easily be raised by traction on the suture to facilitate further enlargement of the section, iridectomy, and so forth.

Before the delivery of the lens, the sutures must be loosened adequately across the wound. In using an erisophake, care must be taken not to catch one of the sutures on it when it is removed from the anterior chamber. One definite advantage of this suture is that the eye may be closed promptly by picking up and tightening any one of the sutures.

In uncomplicated cataract, however, I feel it is wise to lift the corneal flap slightly and allow the iris to fall into position normally or irrigate it, if a round-pupil extraction was done. Only after the wound is clear of all iris or other tissue should sutures be tied.

The previously placed loop knot may be untied by pulling on the suture end, since it is a slip knot, or it may be cut off, depending on the agility of the assistant. If the suture is cut conservatively, three sutures can be placed and enough will remain to secure the flap at the 3- and 9-o'clock positions, thus covering the wound and sutures completely.

Using this method, I find that most any assistant can perform the duties of holding the suture against the forehead and raise the corneal flap for doing the iridectomy or iridotomy as one prefers. Complications have been negligible. I recommend this technique to any surgeon but particularly to the surgeon without a trained assistant.

P.O. Box 1092.

AN IMPROVED TAPE FOR EYE BANDAGING

JAMES E. ZULLO, M.D.

Rochester, New York

A new, thin, light-weight, plastic tape of adequate tensile strength, easily handled and cosmetically superior to other adhesive tapes, is manufactured under the trade name, Elastape.*

This comes in the usual 0.5 inch by 40 yards or in wider sizes and is flesh-colored, easily torn with the finger tips, and is a 0.0035 calendered (a method for making softer tape) polyvinyl chloride with a dry, inert, rubber-resin, pressure-sensitive adhesive. The adhesive is reported as nontoxic, non-irritating, and nonallergenic. I have seen no reactions (not even a slight erythema) in over 200 cases to date in which this tape was used for from three to seven days.

Its use after postoperative intraocular procedures and for children's dressings seems to me to be its major attraction. It adheres well to slightly moist or oily skin, yet not to hair, so that its removal requires

* Made by the U. S. Plastic Bandage Company, 323 Niagara Street, Buffalo 1, New York.

a minimum of effort and eliminates the common fear that we all have of blepharospasm (with occasional wound rupture, loss of anterior chamber, iris prolapse) in response to the daily "skin-peeling and hair-pulling" routine to which we subject our patients. In addition, the adhesive material was found to remain on the skin but rarely, thus greatly decreasing the need for using irritating solvents about the eye.

Unfortunately, the excessive pliability and elasticity preclude its use for pressure dressings. It is difficult to use on patients with a heavy growth of beard, and, when very cold, the adhesive may come off in irregular splotches on the front side of the tape when peeling it from the roll.

89 *Genesee Street.*

FLUORESCENT TEST OBJECTS*

FOR PANTOSCOPIC TANGENT SCREEN

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AND

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For those faced with the need of doing large numbers of examinations of the central visual field, especially using very small test objects for measuring minimal defects, a pantoscopic, self-recording type tangent screen, such as described by Gunkel and Ryan,¹ offers not only great advantages in time saving and freedom from fatigue in both the patient and the operator, but also freedom from the distracting influence of a wand or other carrier for the test objects.

In addition, a black light technique, using luminescent test objects, as described by Harrington and Flocks,² has made possible much more accurate and reproducible central fields, especially where small test objects are used, since there seems little question that the point

at which the test object comes into the patient's vision can be appreciated more sharply with the black light technique and since the reduced illumination for this technique also reduces to a large degree outside distracting influences.

Attempts to use fluorescent test objects with the pantoscopic screen have been made in some quarters and with some degree of success but outstanding among the barriers to the combined use of the black light technique and the pantoscopic screen has been the problem of making satisfactory small test objects which will be both magnetic, so that they can be moved by the magnet behind the pantoscopic screen, and fluorescent so that they can be used with the black light technique. In the larger sizes, painted test objects can be made using fluorescent paint with fair success, but when test objects of 2.0 mm., 1.0 mm., and 0.5 mm. are attempted, it is necessary to paint them by hand, which is a truly formidable task. In addition, the paint has a distressing tendency to flake off the small test objects and make them unsatisfactory.

Efforts to find a method of making these very small test objects, which will be both magnetic and fluorescent, have led to experiments combining various plastics with iron balls and iron filings and with fluorescent powder and paint. After many trials and errors, a cheap method of making very small test objects, even down to 1.0 mm. or 0.5 mm., has been developed. With this technique the test objects are sufficiently magnetic to adhere to the screen when the magnet is moved rapidly and fluoresce adequately to give a good light source when exposed to the black light lamp. In addition, they are sufficiently easy and cheap to make so that replacement of the inevitable loss of the very small test objects is a rather simple matter.

METHOD FOR MAKING TEST OBJECTS

1. Take Kristal Kraft Resiglas "Fillit" resin paste compound, 4.5 gm. or one level teaspoon.

*From Department of Ophthalmology, Bowman Gray School of Medicine. This work was supported in part by the National Institutes of Health, Bethesda, Maryland. Grant B-213(C4).

2. Add one drop of No. 2 Kristal Kraft Hardener and mix thoroughly.

3. Add 0.8 gm. iron filings (40 mesh) and mix thoroughly.

4. Mix in 1.8 gm., or three level teaspoonfuls, of fluorescent powder,* stirring constantly gradually to get a uniform mixture.

*Fluorescent powder No. C275 (Stagecraft Studios, Blakeley 3, California) was obtained from Jenkel-Davidson Optical Company, San Francisco, California. Kristal Kraft Resiglas and Hardener may be obtained from Kristal Kraft, Inc., Palmetto, Florida.

5. Wait until resultant paste is not sticky but still moderately soft. (This can be hastened by gently warming but too much heat will harden paste too rapidly.)

6. Pinch off a small amount and roll between fingers until round, gradually removing paste until the desired size, as determined by measurement of diameter with a caliper, is reached. Hands must be meticulously clean to avoid darkening of test objects during rolling of balls.

Bowman Gray School of Medicine (7).

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NEW SUTURING FORCEPS FOR CORNEA AND CATARACT WORK*

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At the 54th annual session of the American Academy of Ophthalmology and Otolaryngology held October, 1949, I reported as a new instrument—a suturing forceps for scleral and cataract work (fig. 1). The main characteristics of these forceps were sturdy branches, teeth (one tooth on one side and two teeth on the other) set at an oblique angle, and near the teeth two flat surfaces which came in contact when the forceps were closed (fig. 1-B) to be used for manipulation of either needle or thread. Two pairs of these forceps were made, one with larger teeth for cataract or scleral work (fig. 1-C) and the second with smaller teeth for corneal work (fig. 1-D). The two pairs of forceps were sturdy enough not to wobble, and yet the teeth were fine enough to minimize trauma to the tissue. They were

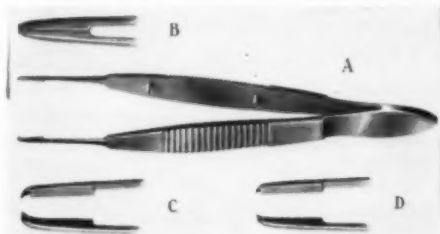


Fig. 1 (Castroviejo). Utility forceps for fixation, scleral, and miscellaneous work.

found particularly useful for the application of border-to-border sutures in corneal and cataract work.

The lighter forceps designed for corneal and cataract work were further modified, retaining the sturdiness, but making the teeth finer in each successive model, thus reducing trauma to the tissues as the size of the teeth were reduced. In the final model with the teeth (1×2) set at an oblique angle, as



Fig. 2 (Castroviejo). Delicate suturing forceps which may be used as an iris forceps or for corneal and cataract surgery.

*From the Department of Ophthalmology of St. Vincent's Hospital, the New York Eye and Ear Infirmary, and New York University Post-Graduate Medical School.

in the preceding models, the teeth were made as fine as possible, less than 0.5 mm., comparable in size to those on an iris forceps (fig. 2).

This new pair of forceps with very delicate teeth has been found invaluable in corneal work, permitting fixation of a fraction of the thickness of the cornea and therefore accurate placement of sutures in the external layers of both host and graft. These fine-toothed forceps have replaced the earlier models used for corneal work and for closing cataract incision, and are so delicate that they can also be used in place of iris forceps.

The previous model with longer teeth of 1.5 mm. has been retained as a utility forceps for fixation of the globe or for suturing any incision which does not require delicate handling. In order to distinguish the two models, the handles have been grooved differently so that each can be easily identified visually or by touch.

9 East 91st Street (28).

The instruments are manufactured by Storz Instrument Company, 4570 Audubon Avenue, St. Louis 10, Missouri.

GELATIN FILM USED AS A SETON IN GLAUCOMA*

ROBERT N. LEHMAN, M.D.

AND

MURRAY F. McCASLIN, M.D.

Pittsburgh, Pennsylvania

In an article recommending the use of gelatin film in trephining operations for glaucoma, Laval[†] reported that Gelfilm[‡] had been placed in the anterior chambers of the eyes of rabbits and no adverse reactions resulted.

* From the Veterans Administration Hospital and the Department of Ophthalmology, University of Pittsburgh School of Medicine.

† Laval, J.: The use of absorbable gelatin film (Gelfilm) in glaucoma filtration surgery. *Arch. Ophthalm.*, 54:677-682, 1955.

‡ Gelfilm is a sterile absorbable film made from pig gelatin.

He also reported that this same substance had been placed between conjunctiva and sclera of human eyes with no undue inflammatory response.

Because of this reported lack of reaction, consideration was given to the use of gonio-subconjunctival tubes manufactured of Gelfilm to be employed in an attempt to control intraocular pressure in glaucoma. However, this substance does not lend itself to tubing fabrication. Accordingly, its use as a simple flat seton was then considered.

TECHNIQUE

A satisfactory surgical technique for the placement of the seton had to be developed. Some difficulty was experienced in this. When cold, Gelfilm is quite brittle and fragments easily; when warm and wet it has the consistency of a soggy noodle. The aqueous liberated on sectioning the cornea to emplace a seton quickly transforms the Gelfilm into this latter state and makes the introduction into the anterior chamber practically impossible. A number of introducers were designed and used without success, until an acceptable technique was finally evolved.

The technique was as follows: A 10-mm. limbal-based conjunctival flap was thrown forward similar to that for an iridencleisis. A 4.5-mm. corneal section was then made at the 12-o'clock position followed by a peripheral iridotomy. A 6-0 double-armed, silk suture, was then placed in the posterior lip of the wound as illustrated (fig. 1-A). A strip of Gelfilm four-mm. wide was placed under the loop of the suture, which was drawn tight, indenting the film into the wound (fig. 1-B). The anterior half of the strip was cut two mm. in front of the suture (fig. 1-C) and this two-mm. end was introduced into the anterior chamber with the aid of a repositor (fig. 1-D). The suture was then cut out and the conjunctiva closed over the Gelfilm (fig. 1-E).

METHOD

Setons were emplaced in each eye of 50 rabbits. The results were consistent with

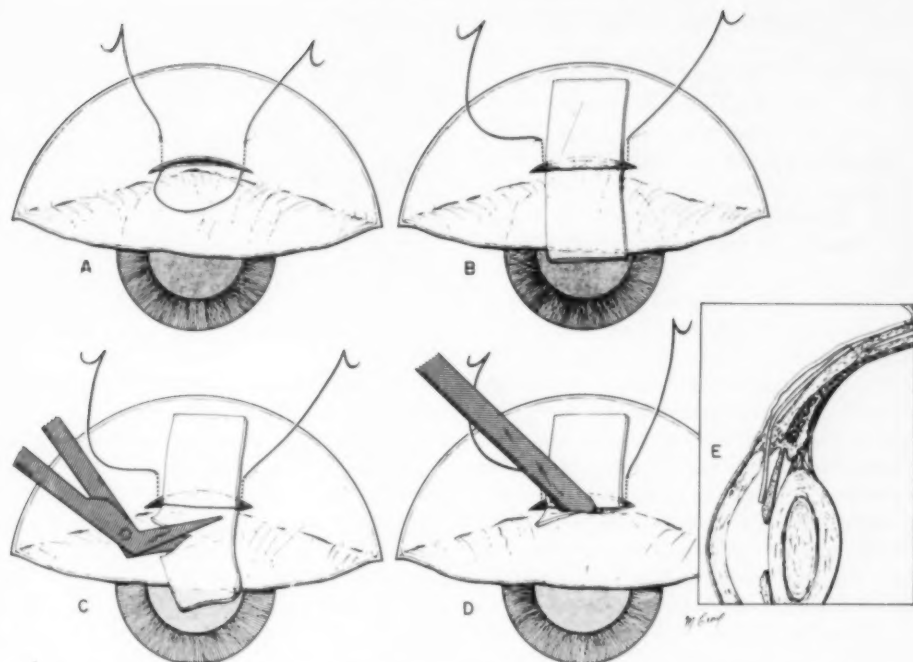


Fig. 1 (Lehman and McCaslin). Surgical technique for the placement of gelatin film seton.

those reported by Laval. In none of these eyes was there any significant reaction grossly or histologically. After the completion of this work on rabbits, setons were emplaced in one eye of two patients with glaucoma. Each of these eyes had poor vision, one from chronic narrow-angle glaucoma and one from chronic open-angle glaucoma. Both patients had pain, ocular tension was high, and the corneas were steamy.

RESULTS

Each of these eyes showed a marked inflammatory reaction following the surgical implantation of the seton and the inflammation gradually became worse. There was erythema of the conjunctiva with edema over the operative site. Slitlamp examination showed a marked flare with a moderate number of cells in the aqueous. Case 2 received local steroids and 10 mg. of Meticorten daily. After 12 days in Case 1 and 14 in Case 2, the setons were removed and immediately the inflammation began to subside.

COMMENT

Although there have only been a few cases reported, the experience would indicate caution in the use of this material. Gelfilm is not innocuous in all cases and, at least in some individuals, it can produce a plastic iritis that will seriously and rapidly aggravate the very condition it is hoped to benefit. It is therefore felt that Gelfilm setons should not be used in the treatment of glaucoma except on an experimental basis until further research on intraocular reactions to this substance.

Gelfilm appeared to be a satisfactory seton because of its lack of antigenic properties. The preliminary experiments with rabbits further justified a clinical trial. It is always possible that the inflammatory response in patients could be attributed to species differences. Another possibility is that in rabbits the setons were implanted in normal eyes, while in humans the eyes selected were in an injured state. This may have contributed to the inflammatory reaction.

University Drive (40).

FLEXIBLE RETRACTOR*

TUTOMU SATO, M.D.

Tokyo, Japan

There are many kinds of retractors for cataract surgery in use today. They are all designed to relieve pressure on the globe while separating the lids for performance of lens extraction, especially in case of total extraction.

In 1956, I designed a new type of retractor and have been using it the past two years with satisfaction. This retractor is designed to retract the upper lid from the globe without pressure and without obstructing the surgeon's hands or instruments in any way. Moreover, it has the advantage of being malleable and may be bent as the surgeon wishes; therefore it is adjustable to the shape of the patient's forehead. I conceived the idea for this retractor in studying Castroviejo's retractor and J. Mueller's method of using one Desmarres' retractor on the upper lid only.

This retractor is made of flexible metal and is inserted under the upper lid after being bent to conform to the curve of the patient's forehead. Because of its malleability it fits perfectly regardless of exophthalmos or enophthalmos. After the lid is retracted with this instrument, two attached strings fasten the retractor to the drapes which are held in the desired position by hemostats.[†]

The following precaution is important. When the retractor is first applied to the upper lid, there should be a space of about one mm. between the retractor and the globe, so that when the bridle suture attached to the superior rectus is wound around the pin on the retractor and the suture pulls down the retractor, the instrument barely touches the globe.

When performing a flap extraction of the lens, I do not apply a retractor to the lower

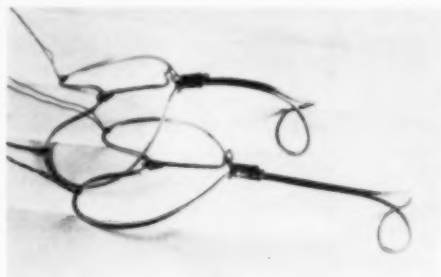


Fig. 1 (Sato). Views of both the crooked and noncrooked flexible retractor.

lid. Instead, I placed a suture resembling the usual inferior rectus bridle suture into the sclera near the inferior limbus. This suture is inserted at a point about six mm. from the limbus at the 6-o'clock position and out at a point about four mm. from the limbus. Of course, this suture must be placed superficially and not perforate the sclera.

This suture is used for two purposes. First, it pulls down the lower lid when the surgeon desires to see the inferior part of the anterior chamber during surgery. Secondly, it is used for zonulotomy, or rupturing the zonules[‡] in intracapsular extraction.

Juntendo University Medical School.

MONOCULAR TRIAL FRAME*

G. PETER HALBERG, M.D.

New York

For some time I have felt the need for a trial frame which could be attached to the patient's spectacles. Since such a device should permit good centering—even on today's "unusual" shapes—it would also have to incorporate a protractor with independent centering. Such a trial frame, it was felt, could increase patient comfort and cut the

*From the Department of Ophthalmology, Juntendo University Medical School.

[†]Sato, T.: Suture in sclera for zonulotomy. *Am. J. Ophth.*, in press.

*This publication was supported by a grant from the Ophthalmological Foundation, Inc., Dr. Conrad Berens, managing director. Technical assistance by Mr. Henry William Matalene of New York City is acknowledged. Manufactured by Matalene Surgical Instruments Company, New York.



Fig. 1 (Halberg). Monocular trial frame units in position.

time required in many situations during refraction and muscle balance testing.

To answer this need a trial frame that can be attached to the patient's spectacle frame monocularly (or binocularly, if necessary) has been designed. The trial frame unit is attached by four movable arms. The arms allow for proper centering of the trial frame unit on almost all types of commercially available spectacle frames. Provision is made for rotating the protractor scale into position. The actual trial frame cells will accept three usual trial lenses or prisms and can be rotated by a ring that forms an integral part of the trial frame unit.

I have found this trial frame unit useful in the following situations:

1. Presbyopic additions to the patient's distance correction—if the latter was known to be correct.
2. Trial of increased or decreased cylindrical corrections in cases in which the axis position was known to be correct.
3. Addition of a cylindrical element in any

desired axis position, when the patient's spherical correction was proper.

4. Addition of prisms in any desired power and position—monocularly or binocularly.

5. For addition of plus or minus spheres during retinoscopy or muscle balance studies, especially when testing children, whose proper fitting with trial frames almost always represents a delicate problem.

6. Patients with aphakia or high refractive errors can be refracted using the spectacle frames in which the final glasses are going to be worn, thus approximating the actual vertex distance.

7. Patients who are overly sensitive to the weight, pressures, and other discomforts of the available trial frames can be refracted over spectacle frames of their own choosing. (The total weight of each unit is 12.5 gm., somewhat less than one-half ounce.)

It should be of some interest to know that the trial frame unit can be positioned or removed in a matter of seconds without the use of tools. The spectacles to which the trial frame units are applied do not require any kind of alteration. During the extensive try-out period none of the spectacle frames was damaged in any way by the application of this device.

SUMMARY

A monocular trial frame unit is described that can be fitted individually over the right or the left eye using the patient's spectacle frames. These monocular fit-over trial frame units were found to be useful in different phases of refraction and muscle balance testing.

936 Fifth Avenue (21).

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WILMER MEETING 1959

The 18th clinical meeting of the Wilmer Residents Association was held in The Johns Hopkins Hospital March 19 to 21, 1959. Over 300 ophthalmologists from all parts of the country attended and listened to two and a half days of papers and contributions by the residents, ex-residents, house officers, and past and present associates of the Wilmer Ophthalmological Institute. This annual

meeting, established 18 years ago, then attracted but a handful of audience. Since then it has steadily grown into a major ophthalmologic meeting, awaited each year eagerly by a growing and loyal group of "aficionados." Attendance is by invitation only but the growing list threatens to swamp the catering facilities and burst the walls of a large amphitheatre.

This popularity is an earned and deserved

one. The scientific program, for the most part reviewing the work done in the Institute during the past year, is consistently of the highest caliber. The social activities maintain the best traditions of Southern Hospitality. There is a delightful aura of friendliness, informality, good humor, and relaxation that embraces the whole affair from start to finish. The program runs along with precision, the essayists are obviously trained in the presentation of their papers, their lantern slides are superb photographs, excellent charts, and, for the most part, legible legends (more could be done, however, to improve this last).

The subjects covered a wide field of clinical and laboratory interest. Prof. A. E. Maumenee, the director, led off with an excellent analysis on the "Mechanics of filtration in glaucoma surgery." He was followed by the visiting guest professor, Norman Ashton, who spoke on "Rhabdomyosarcoma." Alan C. Woods gave a delightful essay on "An adventure in ophthalmic literature," a detectivelike report on tracing and the discovery of Straub's rare book (in Dutch) on lens-induced uveitis. This paper is shortly to appear in *THE JOURNAL*, so look forward to a delightful treat.

Robert B. Welch's paper on "Some aspects of surgery for retinal detachment" reviewed 403 cases. He found that the buckle operation is better for bad cases, the diathermy for favorable cases. J. W. McMeel and Frank B. Walsh covered the difficult subject of "Skull fractures and ocular signs." Essentially it was a discourse on the mechanical stresses and engineering problems associated with fracture of the skull. J. E. Eisenlohr and F. B. Walsh then reviewed the disturbances of the extraocular muscles in systemic disease.

The controversial subject of "Traumatic hyphema" was handled very well by the Tilletts, Charles and Grace, who followed up 94 percent of 158 cases for a long time, an extraordinary achievement. They conclusively showed that pilocarpine, used early in

such cases and for as long as necessary, is the drug to be used. H. E. Whalen's review of his investigation of uveitis helped us further along in this thorny problem.

Bernard Becker in "Newer miotics in the management of glaucoma," introduced his studies on B.C. 48 and phospholine iodine, drugs that may prove to be of much importance in this disease. C. Lawrence reviewed the "Current status of applanation tonometry and tonography" confirming Goldmann's work. D. A. Rosen discussed his experience with the "Ocular pressure effects in the Valsalva maneuver" (increase of the intrapulmonic pressure by forcible exhalation against a closed glottis). A positive effect was normal, as a rule, but in uncontrolled glaucoma it was negative.

A. M. Silverstein and L. Zimmerman's paper was on "Clinical and histopathologic observations on experimental hypersensitivity." This was a beautiful experimental study of the results primarily obtained when a pool of antigen was introduced into the vitreous of an experimental animal and the slow release of this material, which remains a long time in its place, produced its peak of reaction in eight to 12 days. W. A. Brittain and A. E. Maumenee showed in their paper on the minimum reaction to homografts of the corneal stroma (stripped of epithelium) introduced under the skin of experimental animals that, as the corneal stromal cells disappeared, the reaction subsided. J. J. Parks and A. E. Maumenee also revealed, in the next paper, that the avascular cornea can react to immediate and delayed hypersensitivity. This paper may well be earth shaking to all immunologists.

The program on the next day opened up with two papers of clinical importance: "Cystinosis," by N. L. Newton, and "Ochronosis oculi in alkaptonuria," by B. Rones. This latter contained probably the first report of the ocular histopathology of this disease in the literature. C. P. Richter, J. R. Duke, and J. B. Sidbury, Jr., gave a neat paper on the development of cataracts in rats on

a diet of yogurt (commercial) and showed that the cataract was produced by the high percentage of galactose in yogurt. Angus MacLean discussed hemangioma of the choroid and pointed out the importance of intravenous fluorescein and observation of the tumor with a cobalt-blue filter as a method, more or less reliable, for differential diagnosis. L. H. Pierce described a large series of cases of retinal detachment in children and adolescents. This presentation was followed by a highly technical paper by D. H. Hubel and T. N. Wiesel on "Studies on the neural basis of vision." Due to the able way this paper was presented, I was able to follow most of the argument at the time, but this has been lost since then.

The meeting continued with J. I. Moore who presented a case report of Kaposi's disease (angiosarcoma) of the right lacrimal duct. J. L. Smith, reporting on the work of Cogan, et al., at the Howe Laboratory, discussed the "Effects of posture on the ophthalmodynamometric diagnosis of carotid insufficiency." This paper will be published shortly in the *A.M.A. Journal* and is an important contribution to the study and diagnosis of carotid artery disease. H. K. Goldberg, C. Marshall, and E. Sims pointed out the importance of "The electroencephalogram in congenital dyslexia." M. E. Randolph and S. W. Wolf ably reviewed the subject of "Glaucoma in young adults." John McLean disclosed some fascinating medical detective work in his investigation of a long-standing case of Eales' disease. He showed some evidence that the vitreous hemorrhages here were associated with PTA (Rosenthal's syndrome) deficiency. This concept is very complicated but may well initiate further studies along the lines of the various hematologic factors that might be responsible.

Louise L. Sloan continues her important studies on color blindness and here discussed "A possible new form of hereditary total color blindness." R. Teasdall and M. L. Sears ended the second day's meeting with a discussion of "Ocular myopathy," conclu-

sively showing that ophthalmoplegia progressiva was due to ocular muscle disease and not to cranial nuclear lesions.

The final meeting consisted of three papers of clinical interest: "Visual loss and field defects in endocrine exophthalmos," by R. E. Kennedy who pled for conservatism in the treatment of this confusing disorder; "Ophthalmodynamometry" by R. A. Schimek, wherein the author detailed his experience with this procedure in the diagnosis of occlusion of the carotids; and finally a beautifully illustrated lecture by R. Lindenberg on "Intracranial lesions involving the chiasm."

The meeting concluded with a most delightful and informal clinic of neuro-ophthalmologic interest with presentations of patients with unusual and fascinating conditions, by F. B. Walsh, master of this field.

Dr. F. H. Verhoeff, who has missed few of these meetings in the past, was unable, because of poor health, to be present. His pungent and highly informative and instructive, often needlelike, remarks on nearly any subject, were greatly missed by all, even the essayists. A telegram and message of friendship signed by all members of the audience, was dispatched to him with love.

Derrick Vail.

CORRESPONDENCE

TRABECULA; TRABECULUM

Editor,

American Journal of Ophthalmology:

The letter of Dr. Bertha Klien which appeared in the February issue of *THE JOURNAL* gives me a welcome opportunity to send you a note on the word "trabeculum," which I have wanted to write for some time.

It pains my sense of chivalry to have to disagree in part with Dr. Klien whom I admire so greatly. But, unfortunately, there is no such word as *trabeculum*.

Trabecula is a diminutive of *trabs*, meaning a beam or timber. There is no collective noun *trabeculum*, meaning a group of trabe-

culae, although *trabs* itself is used in a transferred sense as a collective noun meaning ship, roof, and so forth.

It is really too bad that the word does not exist. I missed it sorely when I was writing the papers concerned with the chamber angle which came out of our department. I suspect that someone else felt the same way when he coined the word *trabeculum*, which has first appeared in the American literature but has since also invaded some French and German articles and books. However, it would seem that some of our confreres have heard that there is something wrong with *trabeculum* and have resorted to other, amusing (or distressing) uses, as Dr. Klien points out so well; for example, making *trabecula* the plural form of a noun of neuter gender.

The *trabecula*, the individual "beam," is indeed the building block of the meshwork of the angle of the anterior chamber. In their totality the *trabeculae* make up the corneoscleral and uveal meshwork. The two latter terms are perfectly adequate and I see no reason why they, together with the adjective *trabecular*, could not be generally adapted. If the term corneoscleral trabeculum has become so firmly entrenched through wrong usage that we have to let it stand, then we should at least not try to glorify it by saying "*trabeculum corneo-sclerale*," thus giving it a cloak of respectable *latinitas* which it in no way deserves.

(Signed)

Hermann M. Burian,
Iowa City, Iowa.

HYPHEMA AND RAISED INTRAOCULAR PRESSURE

Editor,

American Journal of Ophthalmology:

The article by Dr. Milton Loring in the December, 1958, issue of THE JOURNAL, in which he stressed the lack of satisfactory treatment for raised intraocular pressure, associated with hyphema, has prompted me to write this preliminary report of some clinical

research carried out in the Royal Victoria Eye and Ear Hospital, Dublin.

The background to this trial was provided by the experience gained in five cases of hyphema, with raised intraocular pressure, in which paracentesis was performed under general anesthesia and induced hypotension. The great value of being able to lower both blood pressure and intraocular pressure during operation, and in the postoperative period, was evidenced by the absence, in all cases, of further hemorrhage and consequent avoidance of blood staining of the cornea (Werner, Ophth. Soc. U. Kingdom, 1959). The stress laid by various writers on the state of sympathicotonia associated with glaucoma, and the recording of marked falls in intraocular pressure during operations in which the technique of induced hypotension was being used, suggested a clinical trial of sympatholytic drugs in the treatment of raised intraocular pressure (Kenny, 1958). This work has been made possible by the close collaboration between surgeons and anesthetists and underlines the contribution that anesthesia offers in fields of therapy.

In his Bowman Lecture (1957) Sir Stewart Duke-Elder underlined the significance of central control in the etiology of glaucoma. Research by von Sallmann and Lowenstein, and by Gloster and Greaves provided evidence of a diencephalic center of control. The work of Ernst Kurus indicated that the ciliary ganglion acted as an outlying station in receiving stimuli from the baroreceptors in the anterior chamber, relaying them to the diencephalon. When this work began, the choice of drugs lay between the ganglion-blocking drugs (the methonium compounds) and the so-called "lytic cocktail" (a combination of chlorpromazine [Largactil], promethazine [Phenergan], and mepiridine [Pethidine]) whose main action is on the diencephalon. It was soon found however that, although the initial fall in intraocular pressure with the latter combination was very satisfactory, there was no sustained effect, and in cases where prolonged

treatment was required the ganglion-blocking drugs proved more satisfactory.

The cases in this preliminary report includes: seven cases of nonperforating ocular injury with hyphema and rise of intraocular pressure; two cases of concussion injury with increased intraocular pressure and without any observable ocular injury; one case of acute glaucoma; one case of buphthalmos which developed a total hyphema and rise of intraocular pressure after goniotomy; one case of hemorrhage after iridectomy, with an associated rise of intraocular pressure; one case of acute glaucoma where an attempted trephining operation had to be abandoned as a result of hemorrhage; one case of dislocated lens in which a satisfactory intracapsular extraction was performed under lowered intraocular pressure, induced by the use of the "lytic cocktail."

Four of these cases have been selected as illustrative of varying types of problems, and the histories have been provided by the respective surgeons:

CASE 1: Concussion followed by rise in intraocular pressure

A man, aged 39 years, was first seen on June 29, 1958, with a history of having been struck by a golf club, in the region of the left eye, some three weeks previously. He had been treated as an intern patient in a county hospital for two weeks; however, a few days after his discharge his left eye became painful. On admission to the Royal Victoria Eye and Ear Hospital, Dublin, examination showed: scars in the region of the left eyebrow; vision in the right eye 6/6 and in the left eye 3/60 due to edema of the cornea; tension in the right eye 20 mm. Hg and in the left eye 50 mm. Hg.

He was treated with acetazolamide (Diamox) (250 mg., twice daily) and eserine (0.5 percent solution) in the left eye, every four hours. Eight hours later the tension recorded in both eyes was 20 mm. Hg. In three days the tension in the left eye had risen to 49 mm. Hg. Seven days later a paracentesis was performed on the left eye, and on the second post-operative day the tension was 32 mm. Hg. Seven days later a trephining operation was performed on the left eye, but within a further seven days the tension was still 40 mm. Hg.

It was then decided to make a trial of sympatholytic drugs and the "lytic cocktail" was used. A mixture of chlorpromazine (75 mg.), promethazine (75 mg.), and mepiridine (75 mg.) was given very slowly in saline solution to 30 ml. intravenously. When 10 ml. had been given the tension in the left

was 30 mm. Hg; 20 ml., 25 mm. Hg; 30 ml., 15 mm. Hg.

The patient fell asleep, not to awaken for four hours; he was then sedated with chlorpromazine (25 mg.) and Phenergan (25 mg.) tablets, three times daily. On the following day his ocular tension was 24 mm. Hg and on the next day it was 38 mm. Hg.

It was now realized that a large dose of the "lytic cocktail" was necessary to maintain a low ocular tension and, as this would result in unconsciousness, it was decided to use the ganglion-blocking drug, hexamethonium bromide (Vegolysen).

The patient was placed in the head-up position (approximately at an angle of 45 degrees) and hexamethonium (50 mg.) was injected slowly intravenously; his systolic blood pressure fell from 120 mm. Hg to 90 mm. Hg and the tension in the left eye fell to 20 mm. Hg. In order to maintain the ganglion block, he was given hexamethonium (100 mg., intramuscularly, twice daily) and, as he was a highly nervous type, he was sedated with chlorpromazine (25 mg.) and Phenergan (25 mg.) twice daily. The systolic blood pressure varied from 90 to 100 mm. Hg and the tension in the eye varied from 23 to 28 mm. Hg during the next six days. The hexamethonium was then stopped and the head-up position was gradually modified.

The patient was discharged from hospital on August 12, 1958, with a tension in the left eye of 26 mm. Hg and vision 6/24. The only further treatment was eserine (0.5 percent drops, three times daily) which was continued for two months. He was last examined four months later when vision in the left eye was 6/18 and the tension was 22 mm. Hg. The left visual field was contracted down to 24 degrees on the temporal side but was full on the nasal side.

The diagnosis in this case was concussion glaucoma, a vasomotor instability determined by a failure in the nervous control of the small vessels; there were no reflex changes in the fellow eye. It would appear that normal vasomotor stability was restored through breaking the vicious circle by means of ganglion blockade, when treatment with acetazolamide, eserine, and operative procedures had failed.

CASE 2: Acute glaucoma

A man, aged 58 years, was admitted to the Royal Victoria Eye and Ear Hospital on August 8, 1958, with acute glaucoma in his right eye of 12 hours' duration. A complete iridectomy had been performed five years previously for a similar condition in his left eye. On admission, his right eye was "stony hard," vision was reduced to hand movements, and the cornea was very hazy. As the condition did not respond to the local treatment and acetazolamide (250 mg.) tablets daily, and as the acute pain was unrelieved by large doses of mepiridine, it was decided to use hexamethonium. The ocular tension was now 48 mm. Hg and the systolic

blood pressure 120 mm. Hg. The patient was placed in the head-up position and hexamethonium (50 mg.) was injected slowly intravenously. During the injection he said that the pain was completely relieved. At the same time his systolic blood pressure fell to 90 mm. Hg and the tension in his right eye to 10 mm. Hg. He was nursed for three days in the 45-degree head-up position, and sedated with chlorpromazine (25 mg.) and promethazine (25 mg.) tablets twice daily. The systolic blood pressure varied between 90 and 100 mm. Hg and his ocular tension gradually rose to 15 mm. Hg. No further dose of hexamethonium was given. Two weeks later the tension in the right eye was 23 mm. Hg and a trephining operation was performed.

A month later the vision in the right eye was 6/9 and in the left eye 6/18. The tension in the right eye was 18 mm. Hg.

This case illustrates the value of hexamethonium in overcoming an attack of acute glaucoma, thus permitting elective surgery to be performed on a quiet eye.

CASE 3: Rise in intraocular pressure after goniotomy (buphthalmos)

A child, aged one and one-half years, suffering from infantile glaucoma developed a total hyphema with very high intraocular pressure two days after a goniotomy operation. On the third postoperative day the anterior chamber was paracentesed, and the blood evacuated by irrigation, under general anesthesia and induced hypotension. The child's systolic blood pressure was 160 mm. Hg. before operation but it fell to 80 mm. Hg following the dose of 30 mg. of hexamethonium. He was nursed with the head of his cot raised and his blood pressure was maintained between 80 mm. and 90 mm. Hg by subsequent daily doses of hexamethonium (20 mg. twice daily) given intramuscularly during the next four days. He was sedated with Luminal (0.25 gr., twice daily). The hemorrhage did not recur and the child was discharged seven days later with an intraocular pressure of 30 mm. Hg and a systolic blood pressure of 110 mm. Hg.

This was the youngest patient in whom an induced hypotension was maintained for several days.

CASE 4

A woman, aged 59 years, was admitted on January 20, 1959, complaining of severe pain in her left eye. She gave a history of having broken her arm 12 days previously, and of her eye becoming painful six days later.

On examination the tension in her left eye was 70 mm. Hg and 20 mm. Hg in her right eye. Her blood pressure was 190/80 mm. Hg. She was treated for a week on conservative lines with acetazolamide, local eserine, and cortisone. The intraocular pressure fell to 50 mm. Hg and the eye became less painful. It was decided to operate on the eye on January 28th under general anesthesia and induced hypotension.

On examination in the theater, her systolic blood

pressure was 285 mm. Hg and her intraocular pressure was 80 mm. Hg. Following a slow and controlled intravenous injection of hexamethonium the systolic blood pressure fell to 80 mm. Hg and the ocular tension fell to 30 mm. Hg. A Scheie operation was performed successfully under ideal conditions.

She was nursed during the following eight days in the head-up position, and her systolic blood pressure was maintained between 80 and 90 mm. Hg with small doses of hexamethonium. She was discharged from hospital eight days later, with a systolic blood pressure of 140 mm. Hg and a tension in both eyes of 17 mm. Hg. She was examined on March 16th when the readings were at the same satisfactory level.

In all instances only the patients who have failed to respond to the usual methods of treatment have been selected for this special technique. No two patients have been identical and the treatment has varied in detail according to the presenting symptoms.

The general outline of our technique may be summarized as follows:

a. *Posture.* The patient is nursed in a head-up position at an approximate angle of 45 degrees.

b. *Ganglion-blockade.* Hexamethonium bromide has been used in all cases. The first dose must be sufficient to reduce the blood pressure and intraocular pressure to a desired level—and subsequently small maintenance doses are prescribed as required. In several cases it has not been found necessary to give these.

c. *Sedation.* Chlorpromazine and promethazine are the drugs of choice on account of their action on the diencephalon and their slight hypotensive effect, as well as their sedative value.

It is our aim to maintain the systolic blood pressure between 80 and 100 mm. Hg. When the intraocular pressure has been within normal limits for three to four days, the treatment is gradually discontinued.

In over 50 percent of the cases treated, a severe degree of hypertension was present, which supports the theory of a generalized state of sympatheticotonia co-existing with a rise in intraocular pressure. It is our intention to do some blood-gas analyses on such

patients to determine the pH $p\text{CO}_2$ and to discover if any constant relationship exists between a generalized physicochemical upset and a rise in intraocular pressure.

It has also been our experience that in the group of patients in which severe pain has been a symptom, the pain has been relieved instantly by the lowering of intraocular pressure. In such cases hypertension has not been present. It may be premature at this early stage to recognize two distinct groups of patients, those with associated hypertension and those with severe pain; in our experience the two conditions have rarely co-existed.

It is our belief that this technique offers a successful line of treatment for patients who might otherwise suffer loss of vision, and that a study of the results may help to elucidate some of the etiologic problems associated with a rise in intraocular pressure.

(Signed)

Sheila Kenny, M.B., D.A., F.F., A.R.C.S.,
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BOOK REVIEWS

THE ANATOMY OF THE NERVOUS SYSTEM: ITS DEVELOPMENT AND FUNCTION. By S. W. Ranson and S. L. Clark. Philadelphia and London, W. B. Saunders Company, 1959, edition 10. 622 pages, 434 illustrations, 11 in color, bibliography and index. Price: \$9.50.

Professor Ranson's well-known and justly popular textbook on neuroanatomy has gone into its 10th edition, revised by Prof. Sam Lillard Clark, chairman of the Department of Anatomy, The Vanderbilt University School of Medicine, Nashville. The book is beautifully printed and lavishly illustrated. The text is authoritative. It is good to know that another generation of medical students, neurologists, neurosurgeons, and even some ophthalmologists will be able to have it on hand for study and reference.

Neuroanatomy is a difficult discipline for the ophthalmologist to master and remember. Our knowledge of it is in constant need of review and repair. While it is true that scarcely a day goes by but that we need to use this knowledge in our daily practice, the fact remains that very few of us have this knowledge completely at our instant service. Much that is contained in this book is of clinical value to us and here is the opportunity to review the facts that were more or less learned in medical school, and to gain new vistas that have been opened up in this field since we have left our schools. It is hard going but worth the labor.

"The charm of neurology," said the eminent British neurologist, Henry Head, "above all other branches of practical medicine, lies in the way it forces us into daily contact with principles. A knowledge of the structure and functions of the nervous system is necessary to explain the simplest phenomena of disease, and this can be only attained by thinking scientifically."

Derrick Vail.

LA TETANIE CHRONIQUE OU SPASMOPHILIE (Chronic Tetany or Spasmophilia). By H. P. Klotz, with the collaboration of M. Bouvry, L. Israel, P. Lumbroso, P. Raverdy, and G. Mett  . Paris, L'Expansion Scientifique Francaise, 1958. 258 pages, 22 figures, full bibliography, paperbound. Price: 1,300 francs.

Chronic tetany presents extremely polymorphous aspects; the predominant symptom may be neurologic, mental, or ocular. Associated findings may be osteoporosis, metastatic calcification, hypoglycemia, edema, and paralysis. Logetschnikov first reported cataracts in young subjects with tetany (1872), and Nordmann delineated the special features of such endocrine cataracts (1928). In this text are reported 30 cases with normal blood calcium in which the definitive diagnosis was made only after the advent of endocrine cataract. The diagnosis was then confirmed by the Chvostek sign, electromyography,

gram, and urine analysis. In a 16-year-old girl treatment with Calciferol not only caused a general amelioration but improved the visual acuity from 20/200 to 20/50. Calciferol (vitamin D₂) and dihydrotachysterol, administered judiciously, give good results.

James E. Lebensohn.

ITINERANT TEACHING SERVICE FOR BLIND CHILDREN. (Symposium.) New York, American Foundation for the Blind, 1957. 106 pages, bibliography. Paper-bound. Price: \$1.00.

Itinerant teaching allows blind children to attend local schools and live at home. This has reciprocal advantages since the daily associations of sighted children with a blind classmate teach the former to accept differences without prejudice. The itinerant teacher must have all the preparation of a good teacher plus additional courses in the specialized area. Itinerant programs are rapidly expanding; some school systems use them from preschool years through high school.

James E. Lebensohn.

TRANSACTIONS OF THE AMERICAN OPHTHALMOLOGICAL SOCIETY, 1958: VOLUME 57. Toronto, University of Toronto Press, 1959. 730 pages, index. Price: \$18.00.

The first feature of interest in this most recent volume of the *Transactions* follows the table of contents. In a listing of officers elected at the annual meeting we find that the editor of THE JOURNAL is the new president of The American Ophthalmological Society.

The 21 original papers in this volume begin with a review by Dr. F. H. Adler of the philosophy of the multiple choice questions used in the written examination of The American Board of Ophthalmology. A new appreciation for the skills involved in making up good questions results from a perusal of this article. This should be required reading for anyone who has a hand in making up

examination papers. Dr. Burian's paper on retinal degeneration caused by large doses of NP207 (a tranquilizer) is both a model of investigation of the visual functions of the eye and a warning against the indiscriminate use of new drugs.

Dr. Cogan presents one of his usual erudite expositions in an article on lipid keratopathy and atheroma. Apparently both vascularization and a high lipid content in the blood are necessary for fatty degeneration of the cornea to develop. The argument of peripheral versus complete iridectomy continues in an article by Dr. C. D. Townes. Since his results are not clear cut this controversy bids fair to go on.

John King continues to report on the use of preserved ocular tissues for transplantation. Not only the cornea, but vitreous, conjunctiva, sclera, and the lens have been preserved. Dr. King's work is truly important because it may open a whole new universe of ocular surgery. Dr. Alvaro of Brazil has an interesting report on the eye problems of one of the last groups of humans in the world as yet uncomplicated by the so-called advantages of civilization. Dr. Berke presents his usual meticulous anatomic and surgical data on ptosis repair via an external approach.

The "New Instruments" section is a testimony to the continued mechanical ingenuity of Dr. Ramón Castroviejo. All four articles in this section are by him.

Finally there are seven theses included in this volume: The first by Frederick C. Blodi is an excellent study of corneal damage by Xrays to adjacent structures. Thirty-one cases are presented and this is followed by an experimental study that supports the conclusion that in addition to superficial epithelial damage there is severe stromal injury with doses of Xrays greater than 900 r.

Dr. Leonard Christensen's thesis is devoted to the cytooid body. Differential staining shows it to be a nonspecific deposit of ocellular origin.

Dr. Hollenhorst discusses carotid artery

insufficiency and in a series of 124 patients shows that this may often be the cause of transient loss of vision.

Dr. Maumenee presents a fascinating theory for the etiology of congenital glaucoma. He believes the latter is due to an insertion of the ciliary muscle fibers into the trabecula anterior to the scleral spur. His very fine sections of eyes with congenital glaucoma support this view. He must bear the consequences of the controversy which his stimulating thesis will kindle.

Dr. McCaslin gives a review of magnetism and hand electromagnets and describes an improved instrument for eye surgery. Dr. G. L. Sullivan reviews epithelialization of the anterior chamber, and Dr. Fred Wilson summarizes his vast experience with beta irradiation of the eye. He wisely cautions against the indiscriminate use of this powerful tool.

This volume (the first to be published in Toronto) continues the tradition of handsomely illustrated and published books which one had come to expect from the A.O.S. and the Columbia University Press.

David Shoch.

YEAR BOOK OF OPHTHALMOLOGY (1958-59).

Edited by Derrick Vail, M.D. Chicago, The Year Book Publishers, 1959. 407 pages, 78 illustrations, author and subject indices. Price: \$7.50.

Wrote Marcus Aurelius: "Time is a river of passing events, and strong is its current." Derrick Vail, after 10 years with the Year Book, closes his association with this volume. William F. Hughes, Jr., whose work and writings are well known, will be the next editor. Vail's pungent footnotes were so popular that most readers scanned his comments in fine print before starting a systematic perusal. The scribe who prepares the Quiz to demonstrate the value of this publication in-

cluded this year the following questions based on Vail's remarks:

What drug has been suggested for routine use in all keratoplasties?

In what condition is ophthalmodynamometry a useful diagnostic aid?

What special retinal change should be looked for in all cases of ocular proptosis?

What operation is indicated in intractable bullous keratitis?

Is a tube necessary in scleral suture for retinal detachment?

What is an important new tool in study of oculomotor palsies?

What other than prematurity is now suspected as a cause of mental defects?

Bernard Becker contributes a special article on chronic simple glaucoma for this volume. "Eyes which support a tonometer at scale readings less than 4.25 with a 5.5-gm. weight or less than 6.5 with a 7.5-gm. weight are glaucoma suspects." For routine use he favors the Goldmann applanation tonometer. "Around-the-clock acetazolamide administration can lower intraocular pressure for periods of over five years and avoid progression of field loss." In patients who could not continue Diamox therapy, 50 percent were successfully treated with Neptazane.

More evidence is accumulating that massive doses of ACTH, followed by corticosteroids, are effective in controlling so-called thyropathic or pituitary exophthalmos. Otto Barkan (1887-1958), in his candidate's thesis for admission to the American Ophthalmological Society, showed that the pigment changes in the anterior segment differed so characteristically in the open-angle and narrow-angle types of primary glaucoma as to aid in the differentiation. Ironically, he died before he could attend his first meeting. Important articles from the German are appearing in increasing number, and a greater effort should be made to present these condensations adequately in lucid and idiomatic English.

James E. Lebensohn.

ABSTRACT DEPARTMENT

EDITED BY DR. F. HERBERT HAESSLER

Abstracts are classified under the divisions listed below. It must be remembered that any given paper may belong to several divisions of ophthalmology, although here it is mentioned only in one. Not all of the headings will necessarily be found in any one issue of the Journal.

CLASSIFICATION

1. Anatomy, embryology, and comparative ophthalmology
2. General pathology, bacteriology, immunology
3. Vegetative physiology, biochemistry, pharmacology, toxicology
4. Physiologic optics, refraction, color vision
5. Diagnosis and therapy
6. Ocular motility
7. Conjunctiva, cornea, sclera
8. Uvea, sympathetic disease, aqueous
9. Glaucoma and ocular tension
10. Crystalline lens
11. Retina and vitreous
12. Optic nerve and chiasm
13. Neuro-ophthalmology
14. Eyeball, orbit, sinuses
15. Eyelids, lacrimal apparatus
16. Tumors
17. Injuries
18. Systemic disease and parasites
19. Congenital deformities, heredity
20. Hygiene, sociology, education, and history

3

VEGETATIVE PHYSIOLOGY, BIOCHEMISTRY, PHARMACOLOGY, TOXICOLOGY

De Rosa, L. **Activity of lactic dehydrase in cataractous lenses in experimental uveitis.** Arch. di ottal. 62:425-426, Sept.-Oct., 1958.

Uveitis was produced in rabbits by injecting horse serum into the vitreous of one eye, followed in 10 days by intravenous injection of horse serum. In 15 days cataract was formed. The concentration of enzyme measured by the Beckman spectrophotometer changed from 7.08 units per milliliter to 5.92 in 15 days, and to 2.13 after 25 days. (1 table, 6 references)

Paul W. Miles.

De Rosa, L. and Testa, M. **Electrophoretic studies of the water soluble proteins of the lens.** Arch. di ottal. 62:353-356, Sept.-Oct., 1958.

Rabbits were given sodium iodate intravenously, to produce cataract. Electrophoretic protein patterns of lens extracts were studied before and for 45 days after injection. There was an increase of the alpha fraction and a decrease of the beta protein. (6 figures, 6 references)

Paul W. Miles.

Di Martino, C. **Correcting action of the calcium bisodium salt of ethylenediamino-tetracetic acid on ocular changes due to CoCl_2 .** Arch. di ottal. 62:415-423, Sept.-Oct., 1958.

The chelating action of EDTA is defined and described. The ethylenediamino-tetracetic acid combines with the metallic poison to form some harmless substance which can escape. Metals like mercury, lead, strontium, and nickel can be eliminated from body tissues. The treatment is useful in removing calcium scars from the cornea and also in removing radioactive metals. It has been used in hepatolenticular degeneration and in renal stones.

In rabbit eyes, cobalt causes blocking of cellular enzymes with cataract and fatty degeneration of the choroid, retina and optic nerve, unless accompanied by EDTA. (1 figure, 13 references)

Paul W. Miles.

Drenckhahn, F.-O. and Lorenzen, U. K. **The oxygen pressure in the anterior chamber of the eye and the rate of oxygen saturation of the aqueous.** Arch. f. Ophth. 160:378-387, 1958.

The authors describe a method for the

continuous determination of the oxygen pressure in the aqueous. A platinum electrode is introduced into the anterior chamber as in polarographic analysis. In 13 rabbits the oxygen pressure was between 21 and 46 mm. Hg. Covering the cornea with a layer of paraffin oil made little difference. In eight rabbits which were breathing pure oxygen the pressure rose to a maximum in 20 minutes. (4 figures, 2 tables, 26 references)

F. H. Haessler.

François, J., Rabaey, M., Neetens, A. and Evens, L. **Further perfusion studies on the outflow of aqueous humor in human eyes.** A.M.A. Arch. Ophth. 59:683-691, May, 1958.

In previous papers the authors have pointed out that the depth of the anterior chamber exerts a very considerable influence on the facility of aqueous outflow. In the present study on enucleated human eyes, perfusion studies show that the facility of outflow associated with a change in depth of the anterior chamber is probably based on a change in trabecular structure. The rate of perfusion is as a rule directly and linearly proportional to the tension of the fluid. Restoration of an increased tension yields C and R values which are the same as those obtained at the beginning of the experiment, and there are cases in which resistance either increases or decreases when the tension of the perfusion fluid is increased or restored to its initial value. (3 figures, 20 tables, 7 references) E. J. Swets.

François, J., Rabaey, M. and Evens, L. **Agar microelectrophoresis of the aqueous humor.** A.M.A. Arch. Ophth. 59:692-702, May, 1958.

Electrophoretic determination of protein values in normal aqueous humor offers considerable difficulties because of the fact that the proteins are present only in minute quantities and that there are

considerable quantities of salts present. A new technique is described in which quantitative ultramicroelectrophoresis on agar makes it possible to analyze the minute quantities of protein. A description of the first results is given. (9 figures, 6 tables, 13 references) E. J. Swets.

Gonzales-Jimines, E. R. and Leopold, I. H. **The effect of chlorothiazide (Diuril) on the intraocular pressure of animals and humans.** A.M.A. Arch. Ophth. 60:70-71, July, 1958.

Chlorothiazide (Diuril) when systematically administered has no significant effect on the intraocular pressure. (1 table, 5 references) G. S. Tyner.

Green, H., Mann, M. J. and DevPaul, S. **Elaboration of bicarbonate ion in intraocular fluids.** A.M.A. Arch. Ophth. 59:590-596, April, 1958.

The normal metabolic activity of the lens may contribute a small amount of bicarbonate to the aqueous humor, but the continuous discharge of lactic acid from the lens into the aqueous requires elaboration of bicarbonate in the aqueous to neutralize this acid. In this experiment it was found that the bicarbonate content of the aqueous was higher in phakic than in aphakic eyes. (4 tables, 17 references) E. J. Swets.

Hückel, H. **The albumin content of the aqueous of one eye after withdrawal of aqueous from the other eye.** Arch. f. Ophth. 160:293-300, 1958.

A significant drop in the aqueous albumin content of the second eye followed anterior chamber puncture of the first in rabbits. The maximum decrease was found after seven hours and to a value of about one third that of the first eye. This decrease was not related to the use of cocaine on the cornea because similar results were found under Nembutal anesthesia. A group of animals had an extir-

pation of the superior cervical ganglion done previously. This also did not influence the results. The author states that this phenomenon cannot be explained as yet. (9 tables, 10 references)

Edward U. Murphy.

Jacobson, J. H., Stephens, G., Basar, D. and Gestring, G. F. **The electrical response of human excised retina.** A.M.A. Arch. Ophth. 60:23-24, July, 1958.

Excised human retina retained a response to light for one hour. (3 figures, 1 reference)

G. S. Tyner.

Levene, R. Z. **Dialysis of the aqueous against plasma.** A.M.A. Arch. Ophth. 59:703-705, May, 1958.

The results of aqueous-to-plasma dialysis in the rabbit demonstrate an excess of sodium in the aqueous, although no excess of potassium is present. The excess sodium is to a large extent osmotically balanced by aqueous deficiencies of other substances, presumably electrolytes. (3 tables, 8 references)

E. J. Swets.

Levene, R. Z. **Osmolarity in the normal state and following acetazolamide.** A.M.A. Arch. Ophth. 59:597-602, April, 1958.

This study of the aqueous-plasma osmolar relationship was undertaken because the aqueous osmolar excess in several mammalian species is considered to be the dominant driving force in aqueous humor formation. The concept of an aqueous hypertonicity across the blood-aqueous barrier is discussed. The author questions the validity of the basic assumption that the osmolar concentration of the plasma in the ocular capillaries is equal to that of the plasma in the main vessels. Isotonicity of the fluids across the blood-aqueous barrier is suggested as an alternative. (8 tables, 29 references)

E. J. Swets.

Lieb, W. A., Guerry, D. III and Ellis, L. J., Jr. **Effects of superior cervical**

ganglionectomy on aqueous humor dynamics. A.M.A. Arch. Ophth. 60:31-35, July, 1959.

After superior cervical ganglionectomy there was a fall in intraocular pressure and rate of flow of aqueous on the operated side which persisted for about three days. After this period there was restoration of normal values. (1 figure, 1 reference)

G. S. Tyner.

Montana, J. A. and Sery, T. W. **Effect of fungistatic agents on corneal infections with *Candida albicans*.** A.M.A. Arch. Ophth. 60:1-6, July, 1958.

Studies were done to determine the ocular toxicity, penetration of ocular tissues, and therapeutic possibilities of nystatin and amphotericin B in experimental infections of rabbits with *Candida albicans*. Nystatin could be used as topical drops in a concentration of 100,000 units per milliliter without reaction. It could not be used subconjunctivally without severe reaction. Amphotericin B caused no reaction when used subconjunctivally or as drops in concentrations of 5 mg. per cc. It could also be used intravenously in the same concentration. Neither drug penetrated into the aqueous. Neither drug was an effective therapeutic agent in an established infection of a rabbit cornea. The drugs are of use as a prophylactic agent, since they are fungistatic rather than fungicidal. (7 figures, 3 tables, 17 references)

G. S. Tyner.

Nakajima, Akira. **The effect of inhibitor of carbohydrate metabolism on the electroretinogram in the rabbit.** Ophthalmologica 136:99-107, Aug., 1958.

Various inhibitors were injected alone or in combination through the ear vein of competely dark-adapted rabbits. The electroretinogram in response to a xenon flash was recorded at intervals with an electroencephalographic apparatus the time constant of which was one second.

A change in the shape of the wave followed a lethal dose of sodium malonate and of combined flouride and sodium cyanide. The inhibitors of respiration, the combined injection of flouride and cyanide of sodium, and certain dinitriles increased the b-wave. The effects of glycolysis inhibitors, SH reactors and of an uncoupler of oxidative phosphorylation were equivocal. (5 figures, 11 references)

F. H. Haessler.

Nakajima, Akira. **The effect of amino-phenoxy-alkanes on rabbit ERG.** *Ophthalmologica* 136:332-344, Nov., 1958.

A series of amino-phenoxy-alkanes was tried for their effect on the rabbit ERG, and the following results were obtained. 1. only the primary p-diamino-diphenoxy-alkanes, except that with polymethylene chain $n = 2$, caused drastic changes in the shape of the ERG response, and the whole response disappeared in a few days. The whole pattern of changes was somewhat like sodium iodate ($n = 3$) or dithizone ($n = 6$) and different from that of sodium iodoacetate. 2. secondary and tertiary methyl p-diamino-diphenoxyalkanes caused long-term temporary suppression of the height of the b-wave; in tertiary compounds a periodicity was observed. o-Dimethylaminopentane caused a temporary increase in the height of the b-wave. 3. primary p-mono-amino compounds were least active in the series tested. (6 figures, 13 references)

Author's summary

Oliver, T. K., Jr. and Havener, W. H. **Eye manifestations of chronic vitamin A intoxication.** *A.M.A. Arch. Ophth.* 60:19-22, July, 1958.

Vitamin A intoxication may result in increased intracranial pressure with papilledema, headache and occasional muscle palsies with diplopia. Other signs are exophthalmos, loss of hair, rash, desquamation and cutaneous pigmentation, mi-

grating arthritis, bleeding, hypomenorrhea, hepatomegaly, splenomegaly, and general malaise. The patient had been taking 200,000 units of vitamin A daily for two years. (3 figures, 2 references)

G. S. Tyner.

Schweitzer, N. M. J. and Bouman, M. A. **Differential threshold measurements on the light reflex of the human pupil.** *A.M.A. Arch. Ophth.* 59:541-550, April, 1958.

Evidence is introduced to prove that with constant backgrounds only the energy content of a light flash determines whether a reflex of the pupil takes place. The presence of a background raises the pupillary threshold and it is concluded that the energy content of a flash in relation to that of the background determines whether a contraction of the pupils will take place. (10 graphs, 4 references)

E. J. Swets.

Shah, A., Constant, M. A. and Becker, B. **Urinary excretion of citrate in humans following administration of acetazolamide (Diamox).** *A.M.A. Arch. Ophth.* 59:536-540, April, 1958.

In rats acetazolamide administration has been observed to result in the deposition of calcium phosphate in the tubules and pelvis of the kidney. Ureteral colic has been reported in patients receiving acetazolamide. The recent observation of ureteral colic in patients under Diamox therapy for glaucoma stimulated this study. Ten human subjects under Diamox therapy were examined with regard to urinary citrate excretion before and after institution of this therapy. In all the patients there was an average 13 percent decrease in citrate output without corresponding decrease in calcium excretion. The role of decreased citrate in the urine in the formation of renal calculi presents interesting opportunities for further study. (3 tables, 35 references)

E. J. Swets.

Steinvorh, E. **Electrophoretic studies of the reactions of phospholipoproteids in the corneal epithelium of the calf.** Arch. f. Ophth. 160:271-272, 1958.

Using filter paper electrophoresis, the phospholipoprotein curve was separated from the total lipoproteids. (1 figure, 1 table, 2 references)

Edward U. Murphy.

Steinvorh, E. and Münich, W. **Electrophoretic studies of the reactions of various glucoproteins in the calf's eye.** Arch. f. Ophth. 160:267-270, 1958.

Curves were determined for the corneal epithelium, iris, lens, and retina. (5 figures, 1 table, 14 references)

Edward U. Murphy.

Stepanik, J. **The electric potential of the eye and experimental raising of the intraocular pressure in humans.** Arch. f. Ophth. 160:226-235, 1958.

The intraocular pressure was raised to various levels up to ischemia of the retinal vessels. The resting potential of the eye as measured by the electro-oculogram showed no real change while the pressure was applied, but a definite increase in the potential was noted as an after-effect. (4 figures, 16 references)

Edward U. Murphy.

Ternes, T. **A comparison of Mydriaticum Roche and homatropine.** Ophthalmologica 136:78-82, Aug., 1958.

The new mydriatic brings about earlier mydriasis and cycloplegia than homatropine does and the range of accommodation returns to normal in two or three hours where the effect of other cycloplegics persists for at least 24 hours. It also was found that eyes which reacted to homatropine with an increase in tension did so after the instillation of the new drug but the effect was more rapidly neutralized by pilocarpine. (1 table, 4 references)

F. H. Haessler.

Thomann, Heinrich. **Amperometric determination of the sulfhydryl group content of animal lenses.** Arch. f. Ophth. 160:219-225, 1958.

Studies were made on pig, calf, and beef lenses with amperometric titration in an ammoniacal medium. The cysteine content of lens albumin for the pig is 1.3 percent, for the cow 1.2 percent, and for the calf 1.4 percent. The difference between the cow and the calf is statistically significant and is presumed to be the result of aging. (1 figure, 5 tables, 25 references)

Edward U. Murphy.

Turtz, C. A. and Turts, A. I. **Toxicity due to acetazolamine (Diamox).** A.M.A. Arch. Ophth. 60:130-131, July, 1958.

The authors report a case of leukopenia and exfoliative dermatitis in a patient being treated with Diamox. The tissues recovered with the cessation of therapy. (4 references)

G. S. Tyner.

Unger, Lothar. **Chromatopsia after digitalis.** Ophthalmologica 136:326-332, Nov., 1958.

After ingestion of digitalis a patient may see things colored blue and yellow, red and green, or dazzlingly bright as though covered with snow. The phenomena are ascribed to intoxication and disappear completely after use of the drug has been discontinued. The disturbance is presumably extraretinal. (19 references)

F. H. Haessler.

4

PHYSIOLOGIC OPTICS, REFRACTION, COLOR VISION

Best, F. **The Panum effect.** Arch. f. Ophth. 160:247-262, 1958

A theoretical and experimental discussion of depth perception in relation to Panum's area leads to the conclusion that we are dealing with a special case of bi-

nocular stereopsis from the use of paralax. (13 figures, 5 references)

Edward U. Murphy

Betti, L. **Myopia.** *Boll. d'ocul.* 37:518-525, July, 1958.

On the basis of clinical and statistical data the author divides myopia into two categories, differing in their origin and in their course. These two categories include simple myopia and myopia with astigmatism. In myopia with astigmatism he feels that although there may be other responsible factors, it is primarily the astigmatism which tends to induce the myopia. (1 table, 10 references)

Joseph E. Alfano.

Bonaccorsi, Antonini. **Modification of the P.A.R. induced by Fargan, Meperidin and Largactil.** *Rassegna ital. d'ottal.* 27: 350-358, Sept.-Oct., 1958.

The author studied 60 patients with various degrees of hypertension in whom he determined the change in retinal arterial pressure (P.A.R.) and systemic arterial pressure (P.A.H.) which followed the use of drugs. The drugs brought about complete preoperative sedation, tranquility during the operation and lowering of the P.A.R., especially when the latter was pathologically elevated. The treatment reduced the likelihood of retinal hemorrhage. (1 table, 43 references)

E. M. Blake.

Elenius, V. and Heck, J. **Comparison between the b-wave amplitude and the course of regeneration of visual purple in achromats and normals.** *Ophthalmologica* 136:145-150, Sept., 1958.

The progress of dark adaptation was assessed in two subjects with achromasia by means of the amplitude of the b-wave and compared with similar data on three normal subjects. The dark adaptation proceeded more rapidly in the achromats and there was a marked delay in the nor-

mal subject. The delay is ascribed to an inhibition of the rods by the cones. (3 figures, 9 references)

F. H. Haessler.

François, J. and Verriest, G. **A particular form of night-blindness.** *Ophthalmologica* 136:129-139, Sept., 1958.

The authors report a case of night-blindness whose chief characteristic was a retarded dark adaptation. It was probably congenital and cannot be classified among the known types. In the electroretinogram the appearance of the scotopic b₂-wave was retarded. (8 figures, 5 references)

F. H. Haessler.

Frey, R. G. **Which pseudo-isochromatic plates are the most useful in practice?** *Arch. f. Ophth.* 160:301-320, 1958.

Each of 144 color-deficient individuals and 144 normal trichromats were examined with six different color vision tests. These tests were the series of Boström, Boström-Kugelberg, Hardy-Rand-Rittler, Ishihara, Rabkin, and Stilling. Although each series identified all the color-deficient subjects, the tests of Ishihara and Rabkin gave the fewest false positives. A certain classification into protanopes and deuteranopes is impossible with any of these tests; the best for this purpose is the Rabkin test. The author concludes that a combination of the Ishihara and the Rabkin tests would be the most useful. (9 tables, 28 references)

Edward U. Murphy.

Heck, J. and Zetterström, B. **Electroencephalographic recording of the on and off response from the human visual cortex.** *Ophthalmologica* 136:258-265, Oct., 1958.

The specific cortical reaction in the visual area through bipolar transcranial stimulation was recorded in 100 subjects whose ages ranged from 12 hours to 81 years. Before the age of six months a single light stimulus does not produce a

measurable potential; in the next six months a slow potential appears with flicker stimulation at low frequency. In older children and adults a polyphasic on and off response is noted. The highest flicker fusion frequency (F.F.F.) was found at about 45/sec. In nine of the 60 subjects no potential could be recorded at a single examination. (4 figures, 1 table, 13 references) F. H. Haessler.

Helms, A. and Raeuber, J. **Sensitivity changes in the monocularly dark adapted eye when the other eye is light adapted to various colors.** Arch. f. Ophth. 160:290-292, 1958.

The greatest change occurred when yellow light was used. (1 figure, 6 tables)
Edward U. Murphy.

Helms, A. and Prehn, R. **Sensitivity changes of the dark adapted human eye in monocular light adaptation.** Arch. f. Ophth. 160:285-289, 1958.

The evidence from previous work is conflicting as to whether there are changes in the second eye when the first is stimulated with light. The authors found that the sensitivity of the dark-adapted eye is measurably altered when the other eye becomes light-adapted. (1 figure, 3 tables, 6 references)
Edward U. Murphy.

Jonkers, G. H. **Examination of the visual acuity of children.** Ophthalmologica 136:140-144, Sept., 1958.

The author discusses the results of his statistical study of the relationship of the results of measurements of visual acuity in children of various ages made with various optotypes. (1 figure, 1 table)
F. H. Haessler.

Laue, H. **Normal light sense values with the Goldmann-Weekers adaptometer.** Ophthalmologica 136:204-216, Sept., 1958.

In 50 normal subjects Laue established the average values for four curves for the 11° field, with and without contrast stripes. Measurements were made both with the normal and the dilated pupil. (7 figures, 2 tables, 13 references)

F. H. Haessler.

Oppel, O. **The influence of myosensory impulses from the eye muscles in the egocentric localization of binocular optic after-images.** Arch. f. Ophth. 160:462-472, 1958.

To demonstrate the participation of myosensory impulses from the extraocular musculature in space perception in man, the behavior of after-images with passive movements of the eyeball was observed. Definite relationships between egocentric transfoveal after-images and the positional factor of the eyes was demonstrable. (5 figures, 32 references)
F. H. Haessler.

Viefhues, T. K. and Kuhnhardt, G. **The objective determination of visual acuity in amblyopia.** Arch. f. Ophth. 160:263-266, 1958.

Opticokinetic nystagmus was induced with an apparatus which projected and rotated vertical stripes on a test area. In 20 patients with amblyopia from muscle imbalance it was shown that this method was not suitable for determining the visual acuity. The results usually indicated much better vision than was actually present. (3 figures, 8 references)

Edward U. Murphy.

Widder, Wolfgang. **Graphic representation of the anomaly quotient.** Arch. f. Ophth. 160:418-424, 1958.

The author presents a mathematical analysis as a basis for a graphic statement of the anomaly quotient (AQ) after examination with spectral lights for which the most widely used instrument

is Nagel's anomaloscope. (2 figures, 1 table, 24 references) F. H. Haessler.

Wilczek, Marian. **Need for specially light lenses in small children.** *Klinika Oczna* 28:125-126, 1958.

Lenses made for small children with high refractive errors are frequently very heavy because they are cut from standard blanks. Heavy glasses are uncomfortable to small children and are not worn properly, with resulting damage to vision. The author suggests that specially small blanks should be manufactured for children and also suggests the use of plastic corrective lenses. Sylvan Brandon.

5

DIAGNOSIS AND THERAPY

Berens, C. **A suturing spatula.** *A.M.A. Arch. Ophth.* 59:752, May, 1958.

A suturing spatula has been devised by the author which facilitates the introduction of the needle and the passage of the sutures through the tissues. (1 figure)

E. J. Sweets.

De Rosa, Luigi. **An instrument for enlarging the opening into the anterior chamber.** *Rassegna ital. d'ottal.* 27:347-349, Sept.-Oct., 1958.

The instrument resembles the de Wecker scissors but has the blades curved to accord with that of the limbus structures to be enlarged. Heavier specially-curved scissors seem to be stronger and firmer and several have already been suggested for cataract surgery. Those designed by the writer seem to fulfill the needs. (1 figure, 4 references)

E. M. Blake.

Donahue, H. C. **Some concepts of headache, especially ocular.** *A.M.A. Arch. Ophth.* 59:489-494, April, 1958.

The most common type of headache occurring around the eyes is the vascular

headache, due to arterial dilatation of various distribution through the cranium. Head pain may result from lesions in the eye producing vasodilatation, traction, or inflammation of pain-sensitive ocular structures. Headache due to eye strain or anisometropia is a vague and not completely explained condition which may have a psychologic basis. (17 references)

E. J. Swets.

Drews, R. C. **An analysis of the illumination technique of Cibis.** *A.M.A. Arch. Ophth.* 59:579-583, April, 1958.

In 1956 Cibis published an account of a new technique of oblique illumination for microscopy. Details which are not visible with ordinary illumination are presented strikingly in microscopic sections of the eye. The author attempts to analyze this method in order to improve the interpretation of the sections so illuminated, to plan further applications, and perhaps to extend the usefulness of this technique. (9 figures, 4 references)

E. J. Swets.

Jacobson, J. H. **A precision light source for electroretinography.** *A.M.A. Arch. Ophth.* 60:137-138, July, 1958.

A "glow modulator" tube, type R 1131-C which furnishes a light source 0.093 inches in diameter is described. (4 figures)

G. S. Tyner.

Jonkers, G. H. and Jongbloed, J. **A new adaptometer.** *Ophthalmologica* 136:407:413, Dec., 1958.

The authors describe an adaptometer with which the curve of dark adaptation can be measured objectively and subjectively and they compare the findings with those of other instruments. The curves show the increase of sensitivity logarithmically and the abscissa of time geometrically. The instrument is specially designed for experimental investigation. (6 figures, 4 references)

F. H. Haessler.

Kluyskens, J. **The inversion of the visual fields, an indication of malingering.** Bull. mém. Soc. franç. d'opht. 71:64-77, 1958.

Interpretations of functional disturbances of the visual fields still are contradictory. Kluyskens has had much interest in this problem and ever since 1944 has devoted much time and effort to it. Concentric contractions of the field and inversion of isopters (the target disappears sooner in the centrifugal than in the centripetal direction) were checked in an objective way by EEG and RA (stop-reaction). To explain the process of the disturbances 21 normal subjects were studied, some with and some without knowledge of the principles of the proceedings. Real malingering, the wish not to see, exaggeration of existing symptoms in persons with post-concussional syndrome as well as poor attention were considered as being the main causes for the abnormal fields. In spite of the fact that most disturbances had to be appraised as simulated, a definite organic retinal origin could not always be eliminated. The performance of psychoneurotic persons was often very similar to that of the malingerer. (9 figures, 7 references)

Alice R. Deutsch.

Legrande, J. and Baron, F. **Tonsillitis as the source of ocular diseases.** Bull. mém. Soc. franç. d'opht. 71:313-327, 1958.

The authors stress the consequences of nasopharyngeal abnormalities, especially of the tonsils, which in their opinion need not be acutely infected to be the origin of infection. The effect of the massage of tonsils on specific eye diseases is also mentioned. The beneficial result of tonsilectomy in a series of 78 patients with diverse eye troubles are reviewed. They included cases of anterior and posterior uveitis, herpetic keratitis, recurrent vitreous hemorrhage, and optic neuritis. The after-effects of surgical shock as po-

tential cause for sudden improvement of diseases of all kinds are recognized. Careful bacteriologic tests for identification of the offending organism and preparing of autovaccines is suggested. Specific prolonged desensitization was considered to be a better way to prevent recurrences than just the removal of the probable focus of infection. Alice R. Deutsch.

Norton, H. J. and Sullivan, C. T. **On improving retinal photographic standards.** A.M.A. Arch. Ophth. 59:746-751, May, 1958.

Conclusions and suggestions are made relevant to the films of choice for the recording by color retinal photography of the various types of retinal lesions. (2 figures, 1 table, 5 references)

E. J. Swets.

Palich-Szántó, O. and Szécsi, S. **Desensitizing therapy in allergic diseases of the eye.** Ophthalmologica 136:243-249, Oct., 1958.

The authors desensitized patients by injecting their own serum. For the most part the patients had scrophulous lesions of the cornea and conjunctiva. The results were satisfactory. (6 references)

F. H. Haessler.

Pettinati, Sergio. **Radiologic therapy in inflammatory diseases of the eye.** Rassegna ital. d'ottal. 27:401-437, Nov.-Dec., 1958.

This excellent review of the effects of radium treatment in various ocular diseases presents an up-to-date summary of this form of medication. The results of the study and treatment of 1,271 cases furnish a broad basis for the conclusions drawn. The radio-ophthalmologist had at his disposal a range of irradiational possibilities ranging from beta therapy to plestiotherapy to roentgen therapy proper in diverse modalities. The effect of the rays on various structures, such as the cornea,

lens, uveal tract and optic nerve, are faithfully described. (85 references)

E. M. Blake.

Portolano, F. **Use of brief-acting barbiturate in ophthalmic endobulbar surgery.** Arch. di ottal. 62:427-440, Sept.-Oct., 1958.

The author used sodium pentothal anesthesia on 700 patients, and methyl-ethyl-2-pentyl thio-barbituric acid on 200 more. He found intravenous barbiturate ideal for endocular surgery because it satisfies the need for analgesia, akinesia, and endobulbar hypotension. He discusses preoperative medication and the use of curare.

Sodium pentothal anesthesia was found to be simple in administration, rapid in induction, out of the way of the surgical field, smooth and easily regulated, sufficiently deep for eye surgery, with good akinesia. The endocular pressure was reduced about 50 percent, and venous pressure was down. There was minimal risk of vomiting or laryngeal spasm, and post-operative sedation was automatic. The anesthesia is nonexplosive and safe.

The alternate drug, "Diogenal," was slightly superior in children because of less vagal stimulation during induction. The contraindications included emphysema, asthma, and bronchiectasis. (44 references)

Paul W. Miles.

Radnot, M. **The lytic cocktail for eye surgery in children.** Ophthalmologica 136:186-189, Sept., 1958.

The lytic cocktail, a mixture of Lar-gactil, Phenergan and Dolantine, is used to quiet a child before and after surgery. It also reduces ocular tension. (18 references)

F. H. Haessler.

Redslob, E. **Antibiotics are not a panacea.** Ann. d'ocul. 191:843-844, Nov., 1958.

The author points out that in this day

of widespread use of antibiotics we have forgotten the usefulness of the older drugs. He gives a case history of a child with severe conjunctivitis who did not respond to repeated antibiotic therapy but made a good response to daily application of a silver nitrate solution.

David Shoch.

Ridley, Frederick. **Sterile drops and lotions in ophthalmic practice.** Brit. J. Ophth. 42:641-654, Nov., 1958.

It was demonstrated in one branch of Moorfields Hospital that practically all the drops used, including those in bottles not yet opened, were infected and that Ps. pyocyanea was particularly apt to be present in a wide range of solutions and ointments. It seems that drops in use must be self-sterilizing in that they must in themselves contain effective germicides. For this purpose both phenylmercuric nitrate in a concentration of 0.004 percent and methyl hydroxybenzoate have been found to be effective against most likely bacteria and they are harmless to the eye. Oily drops were found to be very difficult to sterilize and have been abandoned in favor of ointments in sterile tubes. (9 figures, 1 table, 4 references)

Morris Kaplan.

Schirmer, R. **The construction of a new ophthalmodynamometer.** Ophthalmologica 136:413-416, Dec., 1958.

This ophthalmodynamometer has these advantages: 1. it has a key to arrest the plunger, 2. a window in the handle facilitates reading the scale, and 3. the plunger is prevented from rotating about its axis. (2 figures, 1 reference)

F. H. Haessler.

Sundmark, Eric. **Recording of the human electroretinogram with the contact glass. III. Influence of the shape of the fluid layer between the glass and the eye on the electroretinogram.** Acta ophth. 36: 917-928, 1958.

The effect on the electroretinogram of fluid layers of different shapes between the contact glass and the eye and of the position of the electrode has been studied. A type of contact lens is recommended which has the following characteristics: the electrode is in the corneal part, there is a scleral part with a short radius and a cylindrical part which separates corneal and scleral parts. This gives a fluid layer with a thick corneal part and has these advantages: various parts of the surface of the eyeball are effectively short-circuited, the variations in the resistance resulting from differences in fit of the glass are reduced, the eyelids are held apart without a speculum, and it minimizes the influence of slow eye movements. (4 figures, 3 references)

John J. Stern.

Viallefont, H. Boudet, C. and Boulad, L. **The effects of hypoglycemia-causing sulfa drugs on the eyes of diabetics.** Bull. mém. Soc. franç. d'opht. 71:228-238, 1958.

The sulfa drugs which cause hypoglycemia and are discussed are 2254 RP glicposal-2259 RP and dolipol-D860. Their dosage, control and possible functional effects are described. There is also a short note on their chemical linkage. The results of treatment with these oral antidiabetic drugs on 85 patients are reviewed with special emphasis on the stabilization or progress of retinal disease and on the possibilities of satisfactory presurgical control. A definite opinion on the effect of these antidiabetic agents could not be given because of the shortness of the period of observation but the impression was quite favorable as far as the control of certain types of diabetes was concerned; no special effect could be seen on the development of retinal diabetic complications during the period of observation. (10 references)

Alice R. Deutsch.

Wilczek, Marian. **New models of instruments for extraction of nonmagnetic intraocular foreign bodies.** Klinika Oczna 28:127-128, 1958.

The author presents an instrument for extraction of nonmagnetic intraocular foreign bodies. It has moveable grasping jaws at the end of a long shaft and can be operated with one hand. (2 figures)

Sylvan Brandon.

Woods, A. C., Wood, R. and Senterfit, L. **Studies in experimental ocular tuberculosis.** A.M.A. Arch. Ophth. 59:559-578, April, 1958.

The use of corticosteroids in combination with antibacterial agents may not only suppress the allergic reaction to tuberculin but also suppress the early phagocytosis of the bacilli and thereby leave them vulnerable to the action of the antibacterial agents. If this is true, the prolonged treatment with antibacterial agents now believed necessary to effect a cure of tuberculosis might be materially shortened and the prognosis improved in this disease. In the experiment presented in this paper the combined treatment with corticosteroids and antibacterial agents had no beneficial effect other than the minor one of diminishing early inflammatory response in ocular tuberculosis. The combined treatment had a markedly deleterious effect in that it promoted recurrences of active tuberculosis in the eyes of more than one half of the animals so treated. The results here reported sharply suggest that such combined therapy is specifically contraindicated. (19 figures, 3 graphs, 3 tables, 11 references)

E. J. Swets.

Ziobrowski, Szczesny. **Ocular tuberculosis in children treated in the Eye Sanatorium in Zakopane in 1955-1956.** Klinika Oczna 28:179-186, 1958.

In a sanatorium for children with eye diseases 325 children from five to 15 years

of age were treated during 1955 and 1956. The children were selected for treatment because of tuberculosis contact or poor living conditions. There were 143 cases of phlyctenular conjunctivitis, 153 of phlyctenular keratitis, 25 of uveitis and five of retinitis. A tuberculous etiology was demonstrated in 28.5 percent of patients with phlyctenular keratitis, and in 25 percent of those with uveitis it seemed probable. Two cases of toxoplasmosis of the uvea were diagnosed. (3 tables, 10 references) Sylvan Brandon.

6

OCULAR MOTILITY

Bagolini, B. **A discussion of the difficulty in measuring the objective and subjective angle of squint.** *Boll. d'ocul.* 37: 537-545, July, 1958.

The author discusses the difficulty in measuring the objective and subjective angle of squint. He feels that the use of the campimeter gives the most reliable results. (1 figure, 10 references)

Joseph E. Alfano.

Costenbader, F. D. and Albert, D. G. **Spontaneous regression of pseudoparalysis of the inferior oblique muscle.** *A.M.A. Arch. Ophth.* 59:607-608, April, 1958.

A case of pseudoparalysis of the inferior oblique muscle which disappeared spontaneously is presented. (2 references)

E. J. Swets.

Gergovich, Helena. **Analysis of squints treated in the Eye Clinic of the Medical Academy of Krakow in 1950-1955.** *Klinika Oczna* 28:143-149, 1958.

In the five-year period from 1950 to 1955, 310 patients with squint were operated on in the Krakow Eye Clinic; the squint was unilateral convergent in 157, alternating convergent in 106, unilateral divergent in 23, and alternating divergent in 10. The squint was secondary to eye

disease in 17. The author analyzes refractive errors, visual acuity, and the presence of amblyopia in all of these groups. Because treatment was started late in life (15 to 30 years of age) in 190 patients with amblyopia no improvement in visual acuity followed surgery. Good cosmetic results were achieved in 86.1 percent of the patients. The author feels that treatment of squint should start early in life. (4 tables) Sylvan Brandon.

Johnson, D. S. **Some observations on divergence excess.** *A.M.A. Arch. Ophth.* 60:7-11, July, 1958.

The author reviewed 451 consecutive cases of exotropia of all types in which surgery was done at the Massachusetts Eye and Ear Infirmary. Only in divergence excess was there an apparent definite relationship between type and amount of surgery and the degree of stereopsis. Accordingly, 54 cases of divergence excess exotropia were reviewed. The deviation at near seemed the most important measurement. When the deviation was 25° or less the surgical results were good. In any patient with more than 1 D. of myopia the prognosis was poor. Bilateral lateral rectus recession of 6 mm. or more was the procedure of choice. Results were not affected by vertical imbalances. (11 references) G. S. Tyner.

Lavat, J. and Canque, M. **The present orthoptic and surgical treatment of squint.** *Bull. mém. Soc. franç. d'opht.* 71: 44-63, 1958.

The results of orthoptic training and adequate surgical correction in 64 patients with squint with abnormal correspondence are statistically reviewed. The various training methods, several of them not standard methods, are described in detail. The functional results were very satisfactory and the cosmetic effects were excellent. The optimism of the authors concerning rehabilitation of tropias, usu-

ally considered as uncertain risques and of poor prognosis as regards the attainment of binocular vision, is therefore understandable. (1 table)

Alice R. Deutsch.

Parks, M. M. **Strabismus**. A.M.A. Arch. Ophth. 60:139-170, July, 1958.

A review of the literature for 1957 is presented in abstract form. (202 references)

G. S. Tyner.

Pietrowa, Nonna. **Congenital malposition of eyes treated surgically**. Klinika Oczna 28:209-213, 1958.

In a man, 33 years of age, severe congenital muscle deficiency brought about bilateral ptosis, lagophthalmus, vertical nystagmus, and convergence of 30° of the left eye. There was also microcornea and possible coloboma of the choroid in the left eye. The interior of the right eye was not visible. There was little movement of the eyes and elevation was completely absent. Surgery was performed mainly to bring the pupils down. Congenital absence of the lower rectus muscle was noticed. Tenon's capsule was attached where the tendon of the inferior rectus should be located. Surgery improved the position of the eyes and apparently put the remaining muscles in a better position and made possible a wider range of version of the eyes than before. (10 figures, 3 references) Sylvan Brandon.

Roelofs, C. O. and De Vries, S. **An unusual form of convergent strabismus, with an attempt at explanation**. Ophthalmologica 136:377-384, Dec., 1958.

The authors describe four patients in whom covering one of the eyes provoked its adduction, whereas this phenomenon did not appear when the other eye was covered. They ascribe this phenomenon to feeble innervation for adduction in the covered eye which resulted in a disturbance of the development of the cortical

binocular association in heterolateral occipital representation of the adducting eye. In three of the patients there were additional manifestations of inadequate development of optomotor reflexes such as anomalous optokinetic nystagmus and insufficiency of binocular perception. (1 figure, 5 references) F. H. Haessler.

7

CONJUNCTIVA, CORNEA, SCLERA

Anderson, B. and Oglesby, F. **Corneal changes from quinone-hydroquinone exposure**. A.M.A. Arch. Ophth. 59:495-501, April, 1958.

Certain characteristic lesions of the cornea and conjunctiva occur in workers with hydroquinone. Although the lesions produced by hydroquinone are probably not specific for this chemical, changes gradually develop in the cornea which ultimately lead to marked alterations of its curvature with resulting astigmatism. These alterations of corneal curvature appear long after the early obvious staining and pigmentation of cornea and conjunctiva have disappeared. The chemical seems to affect directly only the superficial layers of the cornea, and the first indication of the late effect is the appearance of Hudson-Stähli lines. The tension generated in the deep layers of the cornea by superficial contracture results finally in high degrees of astigmatism. (3 figures, 2 tables, 10 references) E. J. Swets.

Baclesse, F., Dollfus, M.-A. and Haye, C. **Late results of irradiation treatment in conjunctival epitheliomas**. Bull. mém. Soc. franç. d'ophth. 71:147-154, 1958.

Most ophthalmologists consider surgical excision as the treatment of choice for conjunctival epitheliomas and they restrict Beta-irradiation to the invasive types.

The present study concerns 35 epitheliomas treated exclusively by irradiation.

Radium therapy was discontinued in 1936. Contact therapy (50 k.v.) was restricted to small lesions. During a period of observation of about five years nine clinical cures were achieved. Penetrating radium therapy was used in large and fast-spreading lesions. Three apparent cures were noted in the eight patients in this group. Complications were infrequent. Iritis, opacities of the lense, and glaucoma were some of the sequelae. (4 figures, 1 table) Alice R. Deutsch.

Bietti, G. B. **Problems of trachoma in Japan.** *Rev. intern. du trachome* **35**:275-294, 1958.

During his recent visit, Bietti found that trachoma in Japan does not differ clinically from trachoma in other countries. Most of the cases run a mild course, with slow evolution and retarded scar formation. The author thinks this is the reason for the good therapeutic results.

José A. Ferreira.

Bietti, G. B. and Ferraboschi, C. **A statistical review of an association of keratoconus and vernal catarrh.** *Bull. mém. Soc. franç. d'ophth.* **71**:185-201, 1958.

A possible connection between keratoconus and other ocular diseases has been observed. Progressive myopia, blue scleras, degenerative diseases of the retina and vernal catarrh were found in patients with keratoconus and in members of their families. The statistical review presented in this paper is based on 193,000 clinic patients, none younger than nine years, seen in a period of ten years. There were 182 cases of keratoconus, 733 cases of vernal catarrh, and ten patients with keratoconus and vernal catarrh. A detailed analysis of individual cases and prolonged follow-up studies demonstrated endocrinologic abnormalities of various kinds. The direct association of keratoconus and vernal catarrh was established by using the statistical for-

mula of Yule and the method of Coch. They both revealed that 5.26 percent of keratoconus was found in persons with vernal catarrh as compared to 0.375 percent in other patients. Cause and effect among those two afflictions and the influence of environment on their development and manifestations however is not completely understood. (54 references)

Alice R. Deutsch.

Brand, Imre. **Ophthalmomycosis.** *Ophthalmologica* **136**:368-376, Dec., 1958.

In the classifications of allergic reactions of the conjunctiva and the cornea, mycoses have been neglected. The author discusses a patient in whom a dysidrosis-like rash which consisted of limbal vesicles with a sterile fluid was noted. The lesion is ascribed to allergic sensitization. The patient had extensive interdigital and palmar vascular lesions and similar lesions on the feet. (3 figures, 17 references)

F. H. Haessler.

Conrads, Hans. **Degeneration of the corneal nerve fibers after circular coagulation.** *Ophthalmologica* **136**:401-406, Dec., 1958.

In the eyes of rabbits the corneal tissues were deeply coagulated in a limbal zone 1 to 2 mm. wide. One half to four hours later the animals were killed and the cornea excised. Frozen sections were impregnated with silver by the method of Schultze-Gros. Study of these sections made it possible to follow the temporal pattern of the structural changes which characterize the process of degeneration. (5 figures, 20 references)

F. H. Haessler.

Coulombre, A. J. and Coulombre, J. L. **The Role of intraocular pressure in the development of the chick eye.** *A.M.A. Arch. Ophth.* **59**:502-506, April, 1958.

The purpose of this study was to determine the role of mechanical factors gen-

erated by intraocular pressure in the structural differentiation of the eyeball. Using chick embryos the present study demonstrates that intraocular pressure is an essential factor but not the one in the development of normal corneal curvature. There is evidence that corneal shape is also influenced by the resistance to deformation that develops both around and in the cornea as a result of structural changes at the microscopic level. (5 figures, 6 references) E. J. Swets.

de'Genarro, Giuseppe. **Filtrate of the annelid Nephthys in the treatment of experimental corneal abrasions.** *Rassegna ital. d'ottal.* **27**:383-386, Sept.-Oct., 1958.

Nephthys is a vermiform sea annelid with the capacity to reproduce fragments of its body. It is capable of accelerating regeneration of tissue. The author used a homogeneous, sterile filtrate in the treatment of denuded areas of the cornea. Complete regeneration was obtained in 48 hours in the rabbits' eyes, while others which were given only a sterile physiologic saline solution required 96 hours for regeneration. (1 figure, 1 table, 3 references) E. M. Blake.

Juzwa, Joseph. **Xerophthalmia and keratomalacia with lowered corneal sensitivity in infants.** *Klinika Oczna* **28**:129-138, 1958.

The author presents 17 cases of xerophthalmia and keratomalacia in infants from two to seven months of age, which were seen in the Krakow Eye Clinic in three years. Many of them were prematures and twins. All infants were severely ill. Diarrhea preceded the appearance of ocular signs which were xerophthalmia and a decrease of corneal sensitivity. The use of high doses of vitamins, transfusions, and antibiotics were successful in only seven cases. The author feels that the same infective agent which affects the body affects the central nervous system

and particularly the third nerve which results in xerophthalmia and keratomalacia. (12 references) Sylvan Brandon.

Kimura, K., Obayashi, T., Iwaki, S. and Kitamura, M. **Studies on the trachomatous pannus.** *Rev. intern. du trachome* **35**:295-304, 1958.

Pannus, studied with the slitlamp, is by far more common in confirmed trachoma than in doubtful cases or in nontrachomatous conjunctival disease. Pannus is not pathognomonic of trachoma although it very strongly suggests it. (9 tables) José A. Ferreira.

Kopsa, M. and Marusic, K. **Mosaic-like degeneration of Bowman's membrane.** *Ophthalmologica* **136**:83-89, Aug., 1958.

The bilateral development of this anomaly in five members of one family is described. The subjects ranged in age from 18 to 52 years. The pattern of inheritance was dominant in two consecutive generations. (3 figures, 5 references) F. H. Haessler.

Larmande, A. and Orfila, J. **Serologic studies in trachoma.** *Rev. intern. du trachome* **35**:256-260, 1958.

The complement fixation reaction in the serum was positive in 43 of 100 trachoma patients. There was no relation between the reaction and the stage of the disease. These same serums gave 43 positive reactions with an ornithosis antigen, confirming the relationship between trachoma virus and the ornithosis-lymphogranuloma group. (2 tables, 3 references) José A. Ferreira.

Löwers, G. **The histology of corneal discs collected in keratoplasty and its relationship to the success of corneal transplantation.** *Arch. f. Ophth.* **160**:442-461, 1958.

Histologic study of 53 eyes emphasizes the importance of adequate metachro-

masia in the host cornea. The results show the advantage of a continuous Perlon-Monofil suture. There still is a not inconsiderable risk in corneal transplantation. (1 figure, 7 tables, 27 references)

F. H. Haessler.

Mann, Ida. **Trachoma in Australasia.** Rev. intern. du trachoma 35:261-273, 1958.

Contrary to the general belief, trachoma was found in high incidence, 43 percent, in a survey in Western Australia, Papua and New Guinea. There was little relation between its occurrence and climate, diet, race, nutrition or severity of the disease. Trachoma spreads through personal contacts. (7 tables)

José A. Ferreira.

Mavas, Jaques. **The diagnostic significance of biomicroscopy in tumors of the limbus and of the cornea.** Bull. mém. Soc. franç. d'opht. 71:129-146, 1958.

The clinical diagnosis of limbal and conjunctival tumors is often very difficult; biopsy is often done in spite of the potential danger of seeding malignant cells. Methodical biopsy equals "an optical biopsy of living tissue." This method has been used extensively by the author since 1925. He was able to study 403 conjunctival tumors with the slitlamp. Pathologic investigations, made as indicated, confirmed his findings.

The transparency, color and vascularization of the lesion in question and the surroundings should be inspected not only in white light but with various filters and light sources of various potentialities; the forms and arrangements of the lobules, the blood stream in the capillaries and the amount of surface desquamation should also be investigated. It also is essential to study inflammatory reactions and phagocytes after vital staining with methylene blue and similar dyes. The arrangement of the feeding vessels and the vascularization of the growth itself is

most characteristic for epitheliomas and it is entirely different from the vascularization of papillomas, granulomas, nevocarcinomas or the demoepithelioma of Parinaud. Every single elementary lobule contains an axial capillary which forms a tuft or little glomerulus before descending and losing itself in the dense tumor tissue. Even with increasing growth and additional inflammatory reactions this basic typical design can always be outlined. Exact knowledge of the vascularization of the normal and the pathologic conjunctiva therefore is essential for the correct interpretation of findings. A short historical review is included. There were also some comments on the practical clinical importance of biomicroscopy not only for the diagnosis but also for the evaluation of therapeutic procedures. (6 figures, 7 references) Alice R. Deutsch.

Mazur, Janina. **Abscess of the sclera.** Klinika Oczna 28:151-153, 1958.

The author describes an abscess in the episclera in a man 33 years of age, 2 mm. from the limbus which contained pus. Considerable uveitis was present. Staphylococcus infection was found which had metastasized from another focus. Intensive antibiotic treatment resulted in a cure which left a 3 by 3 mm. thin scar and 5/10 vision as a result of incompletely absorbed vitreous opacities. (2 figures, 6 references) Sylvan Brandon.

Neumann, Eli. **Second season prednisone treatment in vernal conjunctivitis with special reference to corneal complications.** Brit. J. Ophth. 42:674-679, Nov., 1958.

Of 400 patients with vernal conjunctivitis 100 were treated with prednisone and of these 85 were considered to be severe. The treatment consisted mostly of the frequent use of Metimyd drops and was continued from one to 18 months. Most patients had had previous treatment of various sorts. The beneficial results were

very gratifying and although the drug did not effect a cure it was found to be superior to all other steroids in the treatment of vernal conjunctivitis. (3 tables, 1 reference)

Morris Kaplan.

Nordman, Jean. **Some remarks on tumors of the conjunctiva.** Bull. mém. Soc. franç. d'opht. 71:115-128, 1958.

The different types of epithelial tumors and pigmented tumors of the conjunctiva are described. The diagnostic procedures, including biomicroscopy, fluoroscopy and vital staining are demonstrated on slides. Wide excision with biopsy is recommended as the treatment of choice for conjunctival tumors and contact-irradiation is preferred for lid tumors. The benign potentialities of juvenile melanomas is explained. Biopsy is also considered to be permissible in pigmented tumors. This opinion is contrary to older opinions. The changes of X-ray treatment in pigmented tumors of all kinds, not only in precancerous melanosis are discussed. The treatment of choice in pigmented tumors should however be wide surgical excision, preferably with diathermy coagulation even in small lesions. Exenteration of the orbit should be reserved for desperate cases; in case the patient should refuse this mutilating operation acetyl choline treatment, as described by Sauther and Hagen in 1950, could be tried. The author had temporary success with this method in two practically hopeless cases. (35 references)

Alice R. Deutsch.

Offret, G. and Lombard, G. **A case of malignant lupus erythematosus of the conjunctiva.** Bull. mém. Soc. franç. d'opht. 71:173-176, 1958.

A 69-year-old woman with a visceral form of lupus erythematosus developed a necrotizing keratoconjunctivitis. Conjunctival transplantation was successful. Retinal or palpebral lesions of the primary disease were absent. Lupus cells were not found in the blood in spite of a most care-

ful search. Corneal and scleral lesions in disseminated lupus erythematosus are very rare. It is difficult to ascribe them to an antigenic reaction, even though the basic disease is an allergic manifestation.

Alice R. Deutsch.

Paganini, Luciano. **The microscopic structure of keratoconus.** Rassegna ital. d'ottol. 27:329-346, Sept.-Oct., 1958.

Histologic studies of the apex of conical cornea removed from a 28-year-old man are reported. The epithelium showed increased spacing, poor differentiation, and disorientation of the various superficial layers. There was sheathing more anteriorly through cytoplasmic enlargement and giant nuclei with minute chromatic granules. Bowman's membrane showed inhibition of transudate in both layers. The substantia propria was well conserved; the intralamellar spaces were somewhat greater than normal, with some edema which caused marked irregularity of profile. Descemet's membrane was strongly infiltrated with basophilic cells. The endothelium was swollen and partially desquamated. (12 figures, 45 references)

E. M. Blake.

Postic, S. and Jelesic, Z. **Herpetic virus in the anterior chamber in the presence of herpetic keratitis.** Bull. mém. Soc. franç. d'opht. 71:202-212, 1958.

The present study deals with the appearance of the herpes simplex virus in the anterior chamber during experimental herpetic keratitis in rabbits and endogenous herpetic keratitis in man. It relies only on cytologic and biologic factors. The virus strain used in these experiments was derived from a human palpebral herpes blister. The content of the anterior chamber was removed by using Amsler's and Verrey's technique. Two drops of aqueous were placed on a slide and stained; 0.03 cc. were inoculated into the brain of white mice. Intranuclear inclusions could not be seen, but atypical

intracellular inclusions, vacuolated cells and degenerated cells with peculiar pigment capping were found. There were 20 positive cases among 21 inoculated rabbits. Eight rabbits had a mild keratitis even in the other eye. The aqueous of the control eyes was injected into the brain of eight white mice. One of the mice died of encephalitis. The corneas of two rabbits were inoculated with the aqueous of a human eye with dendritic keratitis after Grueter's classical technique. The results were positive. The possible routes of the dissemination of the herpes virus, its presence in the anterior chamber and the possible effects of these traits on the recurrence and frequent torpid course of the disease are discussed. Anterior chamber puncture has been used by the authors in every case of herpetic keratitis and has in their experience shortened the course of the disease. (9 figures, 13 references) Alice R. Deutsch.

Schenk, H. and Hummer, E. **Statistical study of herpetic corneal disease in three decades from 1926 to 1955.** Arch. f. Ophth. 160:368-377, 1958.

In the three decades 508 patients with herpes simplex and 54 with herpes zoster were seen. The results of a statistical analysis of important data are made perspicuous in a tabulation and in the 10 figures. There was a definite increase in incidence in the last decade and recurrences were more frequent. Because the increase is coincident with the use of antibiotics the authors suggest that the reduction in bacterial diseases brought about the increase in herpetic disease. (10 figures, 1 table, 6 references)

F. H. Haessler.

Scuderi, G. **Corneal degenerations in trachoma.** Rev. intern. du trachome 35: 314-325, 1958.

Nine cases are reported: seven with hyaline degeneration, one with amyloid

and one mixed type. (7 figures, 22 references) José A. Ferreira.

Thomas, C., Cordier, J. and Algan, B. **The difficulties of an etiological diagnosis in conjunctival hyperplasia with swelling of the pre-auricular gland.** Bull. mém. Soc. franç. d'opht. 71:177-189, 1958.

The case histories of five patients with severe monocular hypertrophic conjunctivitis and preauricular gland swellings are reviewed in detail; the many difficulties in the evaluation of skin tests and the nearly impossible task of finding the causative germs by culture are explained. The potential aid of anatomic and pathologic investigations are outlined with special emphasis on a patient, a 17-year-old boy, who proved to have a tuberculous conjunctivitis, as ascertained by biopsy and subsequent positive inoculation in guinea pigs. Alice R. Deutsch.

Turtz, A. E. and Mamelok, A. **Intraocular foreign body.** A.M.A. Arch. Ophth. 60:132-136, July, 1958.

The authors report a large intraocular foreign body which had been missed in X-ray studies. It was discovered at time of evisceration. (5 figures, 9 references) G. S. Tyner.

Vancea, P. and Lazarescu, D. **Plexiform type of heredofamilial interstitial corneal degeneration.** Ophthalmologica 136:361-368, Dec., 1958.

The authors describe two cases of corneal degeneration in which there were epithelial and subepithelial nodular polycystic opacities with gray filamentous ramifications. Lamellar keratectomy was done and histologic examination revealed a nodular vacuolar degeneration in the epithelium; Bowman's membrane was destroyed in patches. The stromal lamellae were dissociated because of relaxation of the intercellular spaces. (5 figures, 10 references) F. H. Haessler.

Vitte, G. and Chardot, C. **The treatment of conjunctival nevocarcinoma.** Bull. mém. Soc. franç. d'opht. 71:154-172, 1958.

The potential malignancy of nevocarcinomas has previously justified radical surgery. However, during the last years a certain moderate trend could be observed at many institutions. It was suggested that a quiet nevus should be left alone and watched clinically and through serial photographs. Any apparent growth should at once be followed by wide excision. In large tumors or recurrent tumors subperiosteal orbital exenteration rarely can be avoided. Contact irradiation in massive doses as advised by Baclesse and Dollfus has in rare cases successfully replaced mutilating surgery. In the presence of general metastasis large doses of acetylcholine occasionally had palliative effects and also prolonged life.

The patient in question, a 60-year-old woman, had an exenteration of the orbit because of a recurrent nevocarcinoma. The tumor consisted of fusiform and polygonal cells with granulated nucleus and a large nucleolus. The cells were arranged in sheats, separated by delicate highly vascularized connective tissue. No metastases were seen in the orbital fat. The patient made an uneventful recovery and she has been well for one year. (9 figures, 3 references)

Alice R. Deutsch.

8

UVEA, SYMPATHETIC DISEASE, AQUEOUS

Bean, W. B., Drevets, C. C. and Chapman, J. S. **Chronic atrophic polychondritis.** Medicine 37:353-363, Dec., 1958.

The authors report the ninth case of chronic atrophic polychondritis, a syndrome characterized by destruction, inflammatory response, and atrophy or dissolution of cartilage which may occur widely throughout the body. Iridocyclitis

has been reported in all but one case. Because the disease has spontaneous remissions and exacerbations, and because it occurs in adult life, they think that it is not an inborn but rather an acquired metabolic error. (4 figures, 18 references)

F. H. Haessler.

Heydenreich, A. **Trauma and pigment changes in the iris.** Arch. f. Ophth. 160: 236-246, 1958.

Macroscopic and microscopic pigment changes in the rabbit's iris after direct trauma, such as iridectomy, were studied. A depigmentation in the region of the trauma is followed in two or three weeks by the appearance of new pigment. Similar histologic changes are seen in the human eye. (10 figures, 11 references)

Edward U. Murphy.

9

GLAUCOMA AND OCULAR TENSION

Armaly, M. F. and Burian, H. M. **Changes in the tonogram during accommodation.** A.M.A. Arch. Ophth. 60:60-69, July, 1958.

In seven normal subjects, the C value was increased during accommodation. The authors do not explain the reason for the lowered intraocular pressure during accommodation. (2 figures, 13 tables, 6 references)

G. S. Tynes.

Auricchio, G. and Bárány, E. **Factors which determine ocular pressure in experimental uveitis in the rabbit.** Ophthalmologica 136:249-258, Oct., 1958.

Episcleral venous pressure and intraocular pressure were determined in the eye of a rabbit in which anaphylactic horse serum uveitis had been produced. After enucleation of the eye, resistance to outflow and the hyaluronidase sensibility of the resistance were measured by perfusion. The mean outflow resistance was 114 percent higher in the eye with uveitis

than in the normal eye. Testicular hyaluronidase had a very small effect in some rabbits and a dramatic one in others. The reduction of intraocular pressure with increased resistance to outflow is evidence that the uveitis reduced the production of aqueous. (3 figures, 4 tables, 9 references) F. H. Haessler.

Bessière, Chabot, Dutertre and Mirande. **A comparative clinical study on the ERG and on the dark adaptation in glaucoma.** Bull. mém. Soc. franç. d'opht. 71:1-14, 1958.

Dark adaptation curves and ERG were taken in 32 patients with glaucoma. The adaptometer of Goldmann and the electroretinograph of Alvar are the equipment of choice. The results were charted and compared. There was no parallelism in these tracings. This is not surprising because the modifications of the ERG reflect the normal or abnormal state of the retina while the disturbances of night vision depend on the stage of the optic atrophy present. Neither the ERG nor the tests for dark adaptation reveal early functional defects in glaucoma. They can by no means replace the tests currently used, but they may disclose supplementary facts which in selected cases could be of help in establishing the prognosis. (7 figures, 1 table) Alice R. Deutsch.

de Conciliis, U. and De Rosa, L. **A modified Heine method in surgical therapy of glaucoma.** Arch. di ottal. 62:347-352, Sept.-Oct., 1958.

The author reports 48 cases of chronic simple glaucoma treated by cyclodialysis. In 40 the tension remained below 25 for six months or more without drops. (1 figure, 1 table, 32 references)

Paul W. Miles.

Haisten, M. W. and Guyton, J. S. **Cyclodialysis with air injection.** A.M.A. Arch. Ophth. 59:507-514, April, 1958.

The authors describe their technique for this operation in detail. The incision is placed in a slanting manner beneath one of the vertical rectus muscles so that the muscle will aid in closure of the wound and prevent the loss of the air bubble; avoidance of rupture of the long posterior ciliary arteries is less likely when the incision is in this position. The Randolph cannulized spatula allows the operator to wash out any immediate hyphema and facilitates the injection of air. The cyclodialysis is best performed above where the air bubble will help keep the dialysis open when the patient has his head elevated. An ultimate small functional bleb is most likely to be obtained if the dialysis covers an arc of 130 to 160 degrees. An analysis of results in 84 eyes showed that success in the normalization of tension without further field loss was obtained in 65 eyes. The 84 eyes operated upon included 56 with primary wide-angle glaucoma, eight with narrow-angle glaucoma, and 17 with aphakic glaucoma. Cyclodialysis gave rather good results in a type of glaucoma for which it is not usually employed, namely primary wide-angle type. (5 tables, 7 references) E. J. Swets.

Kein, Suda. **The bulbar compression test in glaucoma.** Bull. mém. Soc. franç. d'opht. 71:15-22, 1958.

The test of Kein Suda represents another diagnostic aid in the diagnosis of early glaucoma. A weight of 50 g. is held on the eyeball for 10 minutes and the ocular pressure taken at regular intervals. In normal eyes the pressure was reduced almost to zero levels, definitely not higher than to 4 mm. Hg. A tension of 8 mm. Hg as final pressure was considered as probably indicating glaucoma. The findings in normal eyes of different ages and in glaucomatous eyes are reported and the results are interpreted. These results were very similar to those achieved with the Berens-Tolman bulbar

compressor and with some experimental work done by Duke-Elder since 1950. The effects of this steady ocular compression are discussed in detail. The technique as presented by the author is thought to be a simple method to evaluate qualitatively but not quantitatively the increased resistance to the outflow in the glaucomatous eye. (2 figures) Alice R. Deutsch

Moses, R. A. **Constant-pressure tonography.** A.M.A. Arch. Ophth. 59:527-531, April, 1958.

One of the uncertainties of tonography is the determination of the coefficient of scleral rigidity. In this experimental study the intraocular pressure has been maintained by adding weight to the tonometer plunger as fluid leaks out of the eye. This has the effect of eliminating the necessity of assuming an average value for the coefficient of scleral rigidity. A method for performing tonography in this manner is described. The general agreement between ordinary and constant-pressure tonography makes the additional effort of this method seem hardly justified. E. J. Swets.

Moses, R. A. and Hahn, K. A. **The effect of the tonometer footplate hole on scale reading.** A.M.A. Arch. Ophth. 60: 36-48, July, 1958.

The authors conducted studies to account for the discrepancies in P_0 and C values obtained with tonograms starting with scale readings of less than 3 and those with a higher plunger load and readings greater than 3 on the same eye. They came to the conclusion that clinical measurements of P_0 and P_1 at scale readings of less than 3 are inaccurate. The size of the footplate hole influences the scale reading in the range of scale 3 and less. In scale readings of 2 or less the cornea bulges up into the gap between the footplate and the plunger. The authors believe that the central hole in the

tonometer footplate should be standardized. A maximum diameter of 3.70 mm. is recommended. (16 figures, 4 references) G. S. Tyner.

Nover, A. **Hydrophthalmos in fish.** Ophthalmologica 136:108-116, Aug., 1958.

Nover describes two goldfish with a conspicuous enlargement of the cornea and a deep anterior chamber. Histologic study revealed a markedly thin cornea when compared with the normal. The chamber angle was large, the annular ligament was considerably compressed and loosely filled the space. The optic disc was deeply excavated. (7 figures, 1 table, 18 references) F. H. Haessler.

Ourgand, A. G., Étienne, M. and Vola, J. **Prolonged tonography.** Bull. mém. Soc. franç. d'opht. 71:23-37, 1958.

The effect of a 10-minute tonography on the apparent variations of coefficient C was investigated in 42 normal and 55 glaucomatous eyes. The tonometer of Sclar with weights 5.5 and 7.5 respectively was used. Only eyes with normal scleral rigidity were considered. The tracings were evaluated in two groups. The first group included information on $C0/10$; the second group referred to seven successive periods, namely, $C0/4$, $C1/5$, $C2/6$, $C3/7$, $C4/8$, $C5/9$, and $C6/10$. The technical difficulties, the intricate relationship between $C0/10$ and $C0/4$, the possible difference in the coefficient of Grant and a coefficient C' referring to successive tonographic readings and the potential superiority of other methods of tonography are recognized. The effect of the depth of the anterior chamber, the effects of a special irritability of the capillary level and possible retrograde passage in the blood-aqueous route with their potential interference on the correct reading of tonograms are discussed. (2 figures, 3 tables) Alice R. Deutsch.

Prijot, E. **A new method of tonography.** *Ophthalmologica* 136:266-273, Oct., 1958.

This method makes it possible to calculate the resistance to discharge without considering the ocular rigidity. The results in 20 normal subjects are described. (3 figures, 1 table, 14 references)

F. H. Haessler.

Sédan, J. and Aouchiche, M. **Glaucomatous anesthesalgia.** *Bull. mém. Soc. franç. d'opht.* 71:38-44, 1958.

Esthesiometry of the bulbar surface has been investigated at only a few medical institutions in spite of the fact that disturbances of the corneal sensitivity and sudden pain are known as early signs of glaucoma and as forerunner of possible trophic disturbances.

The authors have been interested in this subject for many years. In 1947 they demonstrated a corneo-conjunctival hyposensitive limbal area and a hyposensitive cutaneous region above the medial canthus and they proved a relationship between this hyposensitivity and variations in tension in glaucoma. They stressed the unilaterality of these abnormalities. The testing is time-consuming and tedious. Only five typical cases were found among 377 glaucoma patients. The case histories of these five patients are the main topic of this paper. A modification of von Frey's technique was used in the early testings. In later years the kerato-anesthesiometers of Franceschetti and of Irn Boberg-Ans were used. Changes in corneal sensitivity are also of diagnostic importance in diseases of the uveal tract. (11 references)

Alice R. Deutsch.

Shaffer, R. N. **Operating room gonioscopy in angle-closure surgery.** *A.M.A. Arch. Ophth.* 59:532-535, April, 1958.

The author advocates gonioscopy after routine peripheral iridectomy in cases of angle-closure glaucoma. With this proce-

dures the surgeon can determine the presence or absence of anterior synechiae and be in a position to make a logical extension of surgical procedure when necessary, while the patient is still in the operating room. (9 figures, 3 references)

E. J. Swets.

Stepanik, J. **The action of Priscol on the episcleral venous pressure in man.** *Arch. f. Ophth.* 160:411-413, 1958.

In 30 eyes with glaucoma simplex the episcleral venous pressure was significantly elevated after the subconjunctival injection of 10 mg. of Priscol. (1 table, 4 references)

F. H. Haessler.

Stepanik, J. **Scleral rigidity during the water-drinking test.** *Ophthalmologica* 136:174-178, Sept., 1958.

The coefficient of scleral rigidity was measured by means of the Friedenwald method of differential tonometry in 63 eyes with glaucoma simplex before and during the water-drinking test. The variations in the coefficient were not statistically significant. (2 tables, 5 references)

F. H. Haessler.

Stepanik, J. **Tonographic study of the water-drinking test in glaucoma simplex.** *Ophthalmologica* 136:385-390, Dec., 1958.

In 58 patients with glaucoma simplex, tonography was done 30 and 60 minutes after drinking one liter of water. When the test was negative the eyes showed a significant resistance to drainage after 30 minutes and the minute volume of the aqueous remained unchanged. In eyes with a positive test the resistance continued and the minute volume of drainage of aqueous was strikingly increased in 30 minutes. (2 tables, 8 references)

F. H. Haessler.

Stepanik, J. **Tonographic study of the action of Priscol on the drainage of aqueous in glaucoma simplex.** *Arch. f. Ophth.* 160:414-417, 1958.

A group of 57 patients with glaucoma simplex who were given 10 mg. of Prisol were studied tonographically. In those eyes in which the tension rose 11 mm. Hg or more the resistance to outflow of aqueous was not significantly (statistically) raised and the minute volume of aqueous outflow was not changed. On the other hand, in those eyes in which an increase in tension after Prisol was less than 11 mm. Hg, the resistance to outflow was unchanged and the minute volume was significantly decreased. (1 table, 9 references)

F. H. Haessler.

Weekers, R. and Laverigne, G. **Changes in ocular rigidity in endocrine exophthalmos.** *Brit. J. Ophth.* 42:680-685, Nov., 1958.

The authors describe a study of the comparative rigidity of the eyeball in the two types of endocrine exophthalmos which are referred to as thyrotoxic or hyperthyroid and the thyrotropic. Rigidity was found to remain more or less normal in hyperthyroid exophthalmos while it was appreciably decreased in thyrotropic exophthalmos and this was attributed to changes in the physical property of the sclera. This was frequently accompanied by an increase in ocular tension which might have been due to interference with aqueous outflow. (1 figure, 4 tables, 10 references)

Morris Kaplan.

10

CRYSTALLINE LENS

De Rosa, Luigi. **A case of anterior lenticonus.** *Rassegna ital. d'ottal.* 27:438-443, Nov.-Dec., 1958.

A 26-year-old man stated that after a burn of the right eye from a stream of boiling water his vision was much affected. Examination showed no abnormality of the conjunctiva or cornea. The iris was normal and the pupil in moderate mydriasis. The anterior chamber was of

normal depth. The central portion of the lens presented a globular projection of perfect transparency. At the base of this formation there was a capsular-cortical opacity with a surrounding collarette at the base of the globular area. The fundus was seen through the normal portion of the pupil and showed no abnormality. Through the normal portion of the lens the refraction was two diopters hyperopic, and five degrees through the abnormal area. General examination revealed no other defects. Only 12 other cases of this condition have been reported. The question remains whether the change in the lens is congenital or traumatic. (1 figure, 17 references)

E. M. Blake.

Di Martino, C. **A case of Marfan's syndrome with unilateral ectopia lentis.** *Arch. di ottal.* 62:357-375, Sept.-Oct., 1958.

In 40 percent of cases of arachnodactylia, the lense is dislocated, usually bilaterally. There are occasional cases of spherophakia, microphakia, atrophy and heterochromia of the iris, coloboma, aniridia and megalo- or microcornea. The pupil is frequently miotic and resists dilatation. Myopia of 15 diopters or more is common. In the case presented, a 13-year-old child had such myopia correctable to 20/20 in each eye. There were persistent partial pupillary membranes, and retinal changes. Near the temporal side of the disc atrophic areas were seen and in the macula dystrophic areas.

The case was unusual in the lack of a hereditary background. The mother had roseola in the tenth and eleventh week of pregnancy. Whether this disease could cause Marfan's syndrome was discussed. (2 figures, 1 table, 97 references)

Paul W. Miles.

Escapini, H. **The cataract wound.** *A.M.A. Arch. Ophth.* 59:653-656, May, 1958.

The technique for cataract incision used

by the author during the past year in 170 cases is described. A peritomy flap, the use of a groove for three preplaced 6-0 gut sutures, and subsequent coverage of the wound by the peritomy flap have been the key factors in the safest technique the author has yet found. (7 figures)

E. J. Swets.

Ogle, K. N., Burian, H. M. and Bannon, R. E. **On the correction of unilateral aphakia with contact lenses.** A.M.A. Arch. Ophth. **59**:639-652, May, 1958.

It is not the purpose of this paper to discourage the use of contact lenses but evidence is presented to show that the patient's subjective satisfaction does not necessarily mean that true binocular vision is achieved. General optical considerations show that it may be difficult or impossible to reduce or eliminate the substantial amount of aniseikonia (nine percent) that remains after unilateral aphakia is corrected by contact lenses. (3 tables, 41 references)

E. J. Swets.

Owens, W. C. **Annual reviews: The lens and vitreous.** A.M.A. Arch. Ophth. **59**:612-624, April, 1958.

The literature for the year 1957 is summarized. (88 references)

E. J. Swets.

Pagani, L. and Santella, I. **Lightning cataract.** Rassegna ital. d'ottol. **27**:387-398, Sept.-Oct., 1958.

The history and examination of two young men who were injured by lightning is given. The biomicroscope showed swollen corneal nerves. The lens presented irregular opacities at the anterior pole, especially in the anterior strata, with diffuse and irregular vacuoles. Posteriorly there were fine, scattered, subcapsular opacities. The lines of the Y-shaped figure, both anterior and posterior, were conspicuous. Festoons were noted in the vitreous. The data relating to cataract produced by lightning and high tension

current in industries are reviewed (2 figures, 44 references)

E. M. Blake.

Segal, Pawel. **Acrylic lenses for the anterior chamber.** Klinika Oczna **28**:187-193, 1958.

The author discusses the advantages and complications of the intraocular acrylic lenses. The anterior chamber lens is easier to place and produces less complications than the Ridley lens. Two cases are presented in one of which the operation was successful; in the other the lens had to be removed because of continued iridocyclitis. (16 references)

Sylvan Brandon.

Weil, V. J., Elisaoph, I. and Laval, J. **Cataract wound healing in the rabbit eye.** A.M.A. Arch. Ophth. **59**:551-558, April, 1958.

On the basis of the fact that histamine is released during surgical trauma, it was decided to determine whether the edema and inflammation promoted by histamine delays wound healing. In this study corneal wound healing in rabbits was observed in microscopic sections in both control and antihistamine-treated groups. It was found that in the rabbit eye corneal wound healing and tissue reaction are adversely affected by antihistamines. Perhaps an explanation lies in the fact that wounds will not heal without an inflammatory response of some sort. (16 figures, 6 references)

E. J. Swets.

Welch, R. B. and Cooper, J. C. **Macular edema, papilledema, and optic atrophy after cataract extraction.** A.M.A. Arch. Ophth. **59**:665-675, May, 1958.

A review of 1,600 cataract cases from the Wilmer Institute revealed 21 eyes in which the entities named in the title appeared as sequelae to apparently uneventful cataract extraction. Serous detachment of the macula is a more appropriate term than macular edema after cataract extrac-

tion. Persistent hypotony does not seem to be a feature in the cases with macular edema alone. Hypotony is a cause of the papilledema which follows cataract extraction. Optic atrophy may occur after cataract extraction and may be associated with papilledema and vascular insufficiency at the disc. (1 table, 18 references)

E. J. Swets.

11

RETINA AND VITREOUS

Alajmo, Arnaldo. **Clinical aspects of the viscosity of the subretinal fluid.** *Ophthalmologica* 135:167-182, March, 1958.

The author used a viscometer based on that of Ostwald and found no connection between the viscosity of the subretinal fluid and a tendency toward replacement of the detached retina. It cannot be exploited as a prognostic sign for surgical treatment. On the other hand to use the failure of preoperative reattachment of the retina as an adverse prognostic sign is not justified. (8 tables, 12 references)

F. H. Haessler.

Apter, J. T. **Prolonged survival of the isolated retina induced by drugs.** *A.M.A. Arch. Ophth.* 59:722-730, May, 1958.

Spontaneous and evoked potentials disappear from the electroretinogram within four minutes after enucleation of the eyes of experimental animals. In this study the effect of seven drugs was studied for their ability to prolong the retinal survival time. These drugs were: strychnine, mescaline, LSD, atropine, Matrazol, epinephrine, and epinephrine. Of these seven all improved the retinal survival time except the last three. Retinal diseases in which the pathophysiology approaches the experimental conditions of the present study include retinal detachment, macular degeneration, and occlusion of the central retinal vein or artery. Studies of the effects of these drugs in appropriate

retinal diseases are now in progress. (5 figures, 34 references)

E. J. Swets.

Brust, A. A. and Witherow, L. **Retinopathies contrasted: diagnostic and prognostic significance of the optic fundi in accelerated hypertension.** *Am. J. Med.* 26:81-112, Jan., 1959.

In 12 pages of text and 114 colored photographs of the fundus the authors review the ophthalmologic manifestations of accelerated hypertension. (114 figures)

F. H. Haessler.

Cameron, A. J. and Ahern, G. J. **Diabetic retinopathy and cyanocobalamin (vitamin B₁₂). A preliminary report.** *Brit. J. Ophth.* 42:686-693, Nov., 1958.

Various reports, particularly by Becker, have indicated an increased adrenal cortical activity in patients with diabetic retinopathy. The disease is usually aggravated by the administration of ACTH. It is possible that diabetes and adrenal cortical hormones act through a deficiency in vitamin B₁₂ or through an inability to metabolize some steroids in the absence of B₁₂. Ten clinical cases of diabetic retinopathy were treated with vitamin B₁₂ in the form of cyanocobalamin intramuscularly daily for 14 days. Frequent examinations and fundus photographs were made. In three cases the degree of retinal exudate diminished appreciably and it was felt that five of the patients improved generally. (2 figures, 3 tables, 12 references)

Morris Kaplan.

Cameron, Malcolm E. **Congenital arterio-venous aneurysm of the retina.** *Brit. J. Ophth.* 42:655-666, Nov., 1958.

Arterio-venous aneurysm of the retina is very rare; only 40 cases have been reported. There is great variety in the appearance of the retina in this disease in that there may be a great mass of tangled vessels obscuring the retina or only one or two large vessels. Frequently one large

artery and vein join directly without any capillary bed, less often there is an angioma as the site of communication, and still less often the two vessels are connected by an anomalous vessel. These findings are all too frequently associated with an intracerebral angioma on either side of the Sylvian fissure which eventually results in hemiplegia in many cases. In most cases the visual fields are normal and in about 30 percent of patients the visual acuity is 6/9 or better. The condition must be differentiated from the von Hippel-Lindau syndrome.

A 25-year-old patient with this condition and the cerebral complication of hemiplegia is presented in detail. The blind right eye had a large artery and vein joined by an anomalous vessel in the retina. (11 figures, 10 references)

Morris Kaplan.

Casanovas, J. and Olivella-Casals, A. **Meyer-Schwickerath's technique of photocoagulation.** Arch. Soc. oftal. hispanoam. 18:308-325, April, 1958.

A cinematographic film constructed for the authors a photocoagulating unit, utilizing an arc light according to the directions described by Meyer-Schwickerath. They report on their experience with this apparatus. Photomicrographs of histologic sections illustrate the effect of photocoagulation of different intensities on the choroid and retina of rabbits. Clinically the authors confirmed the report of Meyer-Schwickerath of favorable results in flat retinal detachment, traumatic hemorrhage, macular holes, retinal periphlebitis, and von Hippel's disease. In postoperative cataract with pupillary occlusion, the technique of obtaining an opening in the iris by photocoagulation is simpler than the surgical procedure used for this purpose. (15 figures, 13 references)

Ray K. Daily.

Clark, Graham. **The importance and employment of diathermy in retinal detach-**

ment surgery of today. A.M.A. Arch. Ophth. 60:251-254, Aug., 1958.

Clark outlines the advantages of his method of surgery in which he applies the diathermy directly to the choroid through an incision in the sclera. (2 figures, 5 references)

G. S. Tyner.

Dell'Aquila, Antonio. **Sintrom in the treatment of venous thrombosis of the retina.** Rassegna ital. d'ottal. 27:359-382, Sept.-Oct., 1958.

The use of Sintrom in the treatment of retinal vein thrombosis proved to be very effective. This conclusion is justified by the improvement of the visual acuity, the fundus picture, and the fields of vision which the author describes in 13 patients. Sintrom is 3-(α -(4'-nitrophenyl)- β -acetyl)-4-ossicumarin. (13 figures, 18 references)

E. M. Blake.

Funder, Wolfgang. **The vortex veins in surgery for retinal detachment.** Arch. f. Ophth. 160:345-367, 1958.

The author describes his experimental work as well as his clinical experience. The vortex veins are vulnerable to certain injuries whose effect was studied in animals and in the eyes of human corpses with the help of retrograde filling of the blood vessels. The vortex veins may be injured by incision, obstruction, and coagulation and these procedures may be followed by local changes in the vein and hyperemia of the uvea. The details of the changes are not completely characteristic of the type of trauma. The experience in 137 cases is the basis of analysis presented in the smaller segment of this report. The author found during surgery for detachment that vortex veins are most often encountered in the lower outer quadrant, much less commonly in the nasal segments and only exceptionally in the upper outer quadrant. The presence of vortex veins in the operative field leads to frequent postoperative intraocular hemorrhage. The prognosis is much poorer after

intraocular hemorrhage and particularly so after perforating coagulation. On the other hand, extraocular hemorrhage after epibulbar injury soon stops and leads to no complications, hence ligation is unnecessary. Hemorrhage can be prevented by ablation of the veins before nonperforating electrocoagulation and also by avoiding perforation. (9 figures, 6 tables, 43 references) F. H. Haessler.

Gartner, S. and Bronstein, M. **Infantile cerebromacular lipoidosis (Tay-Sachs disease)**. A.M.A. Arch. Ophth. 59:584-589, April, 1958.

Five cases of infantile cerebromacular lipoidosis are reported. The term cerebromacular degeneration, often used for this disease, is a misnomer, for the degeneration takes place in the entire ganglion-cell layer of the retina. (4 figures, 1 table, 17 references) E. J. Swets.

Golias-Makowska, Jadwiga. **Angiomatosis of the retina**. Klinika Oczna 28:61-65, 1958.

Three cases of angiomatosis retinae are presented showing different stages of this disease. The first patient had considerably distended blood vessels with numerous overlapping loops but no angiomas or only minor changes in the retina. In the second case there was considerable proliferation of the glia and numerous angiomas. In the third case there was in addition retinal detachment and an angiomatous tumor with two large tortuous blood vessels containing arterio-venous blood. (3 figures, 7 references)

Sylvan Brandon.

Gózon, G. and Rezsoe, P. **The first three cases of retrolental fibroplasia in Hungary**. Klin. Monatsbl. f. Augenh. 133:869-877, 1958.

Three children with RLF were found during a two-year period of observation. All three were born prematurely and had

been given supplementary oxygen. (6 figures, 32 references)

Frederick C. Blodi.

Henderson, John W. **Surgery of retinal detachment—the old versus the new**. A.M.A. Arch. Ophth. 60:249-250, Aug., 1958.

The author makes a plea for the older type of surgery as compared to the newer methods. (2 references) G. S. Tyner.

Hollenhorst, R. W. **Diseases of the retina and optic nerve**. A.M.A. Arch. Ophth. 59:753-802, May, 1958.

An annual review of the literature pertinent to this subject in the years 1956 and 1957 is presented. (570 references) E. J. Swets.

Jacobson, J. H., Basar, D., Carroll, J., Stephens, G. and Safir, A. **The electroretinogram as a prognostic aid in retinal detachment**. A.M.A. Arch. Ophth. 59:515-520, April, 1958.

In 50 cases of retinal detachment the preoperative ERG b-wave amplitude bore a direct relation of high degree to the postoperative visual result and, to a lesser degree, to successful reattachment of the retina by surgery. In no instance where the ERG was extinguished was a visual acuity of better than 20/200 obtained. (2 tables, 10 references) E. J. Swets.

Kearns, T. P. and Sayre, G. P. **Retinitis pigmentosa, external ophthalmoplegia and complete heart block**. A.M.A. Arch. Ophth. 60:280-289, Aug., 1958.

Two cases are reported of this syndrome which apparently has not been described previously. (7 figures, 11 references) G. S. Tyner.

Klien, Bertha. **Diseases of the macula**. A.M.A. Arch. Ophth. 60:175-186, Aug., 1958.

Klien provides a most excellent concentrated outline of the appearances of the

lesions of the macula, and the differential diagnosis of the various degenerations from malignant melanoma. (21 figures and 9 references) G. S. Tyner.

Kozlowski, Bogumil. **Familial macular degeneration of Stargardt.** *Klinika Oczna* 28:49-59, 1958.

Six cases of macular degeneration within one generation of one family and without any obvious hereditary background are presented. The group consisted of four brothers and two sisters, 16 to 25 years of age. Visual difficulties started between 10 and 14 years of age and an oval macular focus with sharply outlined irregular margins was noted, which was as large as the disc in the youngest subject and over twice that diameter in the oldest. The lesion was yellow in the center and had a rough surface with a metallic sheen. In older subjects there were also pigmented foci in the midperiphery. No changes were found in other organs. (6 figures, 4 references) Sylvan Brandon.

Larsen, G. **The viscosity of the vitreous humor influenced by hormones.** *A.M.A. Arch. Ophth.* 59:712-716, May, 1958.

Cortisone, thyroidectomy, and also thyroidectomy plus thyrotropin, increased the viscosity of vitreous filtrate in rabbits. The viscosity remained unchanged under treatment with thyroxin. The ocular tension revealed by the tonometer was not affected. (7 tables, 29 references)

E. J. Swets.

Laws, H. W. and Harpur, E. R. **Lipemia retinalis.** *A.M.A. Arch. Ophth.* 59:521-526, April, 1958.

Lipemia retinalis is a visible ophthalmic manifestation of profound lipid metabolic disturbance found most frequently in diabetic acidosis. A case in which the striking retinal findings were present and later disappeared is described in detail. The literature is reviewed, and a further explanation of the ophthalmologic findings

based on the relationship of red cells to chylomicra is suggested. (62 references)

E. J. Swets.

Linnen, Hans Josef. **The operative treatment of retinal detachment with hole in the macula in myopia magna.** *Ophthalmologica* 136:391-400, Dec., 1958.

To bring about permanent contact between the tear in the retina and the subjacent tissues, a subtotal scleral excision after nonperforating coagulation is made. When there are tears near the ora serrata the procedure of Hruby is applied. When there are equatorial tears and a hole in the macula the operation is combined with Custodis' method of sealing the hole. The results in 16 cases are tabulated. (4 figures, 1 table, 5 references)

F. H. Haessler.

Lopez Marin, Ignacio. **Spontaneous infantile symmetrical bilateral retinal detachment. Report of two cases.** *Arch. Soc. oftal. hispano-am.* 18:326-332, April, 1958.

A mentally retarded girl, nine years old, had bilateral detachment of the inferior halves of the retina. The other patient, a boy seven years old, had a bilateral symmetrical inferior disinsertion of the retina from the ora serrata. In both cases a cure followed bilateral diathermy coagulation, superficial in the region of the detachment, and perforating about the tears. The detachment recurred in the second case one year later. It is believed that the recurrence of the detachment was due to excessive intensity of the diathermy current at the primary operation, which resulted in a new retinal tear. A second operation was followed by a cure. The literature on the etiology and pathogenesis of this type of retinal detachment is reviewed. (2 figures, 15 references)

Ray K. Daily.

Madroszkiewicz, Marian. **Bipolar electrolysis in treatment of retinal detachment.** *Klinika Oczna* 28:71-80, 1958.

The author describes in detail the instrument used by him for electrolysis in retinal detachment surgery. His improvement of the original instrument of Szily is shown. Six cases are presented where electrolysis was used with good results. Electrolysis produces less reaction in tissues and therefore less damage to the retina. It is particularly indicated where detachment is due to an inflammatory lesion. (6 figures, 8 references)

Sylvan Brandon.

Mathur, S. P. **Macular lesion after influenza.** *Brit. J. Ophth.* **42**:702, Nov., 1958.

During pregnancy and after a moderately severe attack of influenza a 25-year-old woman noted diminished vision. The vision was reduced to 6/36 and fundoscopy revealed macular lesions that were probably of vascular origin.

Morris Kaplan.

Omulecka, Danuta. **A case of angiomatosis of the retina (Hippel-Landau).** *Klinika Oczna* **28**:67-70, 1958.

A case of angiomatosis of the retina in a 29-year-old man is described. In the right eye there were two cystic tumors, one in the upper temporal quadrant having two heavy vessels leading from the disc, and the other one in the lower nasal quadrant, each of which was supplied by two heavy vessels from the disc. The retina was otherwise fairly normal. The left eye had a cyst in the temporal periphery. A detachment of the lower half of the retina and numerous exudative and degenerative foci could be seen. Treatment with electrocoagulation and X ray is discussed but was refused by the patient. (2 figures, 8 references) Sylvan Brandon.

Sachsenweger, R. **The differential diagnosis of air emboli in the retinal vessels.** *Klin. Monatsbl. f. Augenh.* **133**:788-797, 1958.

A 27-year-old man noted visual loss eight days after a head injury. This im-

proved after a few days, but amaurosis in the right eye occurred again 10 weeks after the injury and 17 days after an encephalography. The fundus showed a cherry-red spot in the macula and retinal edema. Air was visible in the vessels and atrophy of the optic nerve ensued. (5 figures, 21 references)

Frederick C. Blodi.

Schenk, H. **A new instrument for localization and high-frequency therapy in retinal detachment.** *Arch. f. Ophth.* **160**:340-344, 1958.

The author describes an instrument for exact localization of retinal tears which is particularly useful when the tear is accessible only with difficulty. The point of transillumination of the sclera is sought and marked with the help of a photocell. Steps in the procedure and physical and technical details are described adequately. (3 figures)

F. H. Haessler.

Schepens, C. L., Okamura, I. D. and Brockhurst, R. J. **The scleral buckling procedures.** *A.M.A. Arch. Ophth.* **60**:84-92, July, 1958.

Common technical difficulties encountered during primary buckling procedures are outlined and remedies are suggested. 1. Thinness of the sclera may lead to perforation or rupture of the globe. Measures to combat this include the avoidance of undue pressure on the globe, artificial lowering of intraocular pressure by paracentesis, and careful placement of sutures to close a bulging area. 2. Poor exposure of the area to be buckled may be improved by the use of a cutting spatula and a needle and needle holder. 3. Careful avoidance of vortex veins and long ciliary nerves will prevent late complications. The long ciliary nerves may be seen under the lateral and medial rectus muscles. No diathermy should be placed directly on them. When resecting the strip which is in line with a vortex vein, one should avoid the point of emergence of the vein

if possible. If this is not possible, the vein should be severed after obliteration with diathermy and suture. (7 figures, 1 reference)

G. S. Tyner.

Schwartz, Ariah. **An evaluation of post-operative ophthalmoscopy after retinal detachment surgery.** A.M.A. Arch. Ophth. 60:239-246, Aug., 1958.

Schwartz provides an excellent outline and a series of diagrams of the appearances of the fundi by which one can decide on the prognosis after surgery. He believes a second operation should be done as soon as the failure of the primary operation is recognized. (13 figures)

G. S. Tyner.

Sédan, Jean. **The apparently favorable influence of an intercurrent ocular hypertension and the evolution of certain retinal detachments.** Ophthalmologica 136: 151-157, Sept., 1958.

In 61 cases of retinal detachment surgical operation was without success and afterward postoperative hypotension developed. In 126 successful cases with tonometric equilibrium and an intercurrent hypertension, complete recovery of detachment followed. The associations can hardly have been a coincidence and similar experiences have been reported by Ohm, Halland-Beard and Dufour-Bianchi. (6 references)

F. H. Haessler.

Shafer, D. M. and Bussey, J. L. **Further experience with vitreous implants in old retinal detachments.** A.M.A. Arch. Ophth. 60:255-257, Aug., 1958.

The technique of insertion is described and the inhibition of growth of bacteria by the vitreous is discussed. The authors mention that "physiologic vision" as compared to mere anatomical reattachment is enhanced by the use of vitreous. (4 figures, 2 tables)

G. S. Tyner.

Shipman, James S. **Retinal detachment surgery.** A.M.A. Arch. Ophth. 60:247-248, Aug., 1958.

Shipman describes the advantages of his method of enfolding of the sclera. He believes that patients should be kept in bed two weeks after surgery.

G. S. Tyner.

Suzuki, Kimie. **The changes of the retinal circulation as a sequela of the late toxemia of pregnancy.** Jap. J. Ophth. 2: 277-283, Oct.-Dec., 1958.

In patients who had developed toxemia of pregnancy the retinal circulation was studied by means of an electric sphygmotonometer for a period of four and one half years. Hypertensive retinal changes persist, indicating an increased intracranial pressure, after abnormal labor. No correlation was found between blood pressure and retinal artery pressure. Repeated labors, normal or toxemic, caused an increase in the abnormality of the retinal circulation in susceptible patients. There was a significant difference between patients with normal labor and those with toxemia of pregnancy, even after a period of four years. (3 tables, 7 references)

Irwin E. Gaynon.

Vannas, S. and Setälä, M. **Atypical night blindness.** Acta ophth. 36:849-859, 1958.

A 26-year-old woman with retinitis punctata albescens and night blindness is described. The retinal vessels were extremely narrow, which is atypical, and there was pronounced peripheral atrophy of the choroid. The discs showed large drusen either secondary to circulatory disturbances or associated with a developmental disturbance of the diencephalon. Three out of seven siblings had the same condition and three others had a milder form of night blindness and disc changes. (5 figures, 18 references)

John J. Stern.

Wadsworth, Joseph A. C. **Diathermy or scleral resection.** A.M.A. Arch. Ophth. 60: 258-262, Aug., 1958.

Wadsworth believes that diathermy or scleral shortening operations have a similar effect on the eye. He believes it is more logical to treat the vitreous as well as the retina. A re-expansion of the vitreous body may make simple diathermy the operation of choice. (18 figures, 7 references) G. S. Tyner.

Wagner, Henry P. **Spasm and organic arterial lesions of the retina.** Tr. Am. Acad. Ophth. 62:357-393, May-June, 1958.

This extensive paper is in defense of the concept of spasm or, perhaps more correctly, functional closure of the retinal arterioles. Such spasm is considered to be the cause of amaurosis fugax. Localized constrictions, admittedly, can be due to many causes; but segmental, hour-glass constriction varying in appearance, extent, or location, is deemed to be functional closure. Such changes are now believed to be a mechanical response to variations in endovascular pressure. However, they may be secondary to a local lesion in the vessel, and full weight must be given to the role of local intimal lesions, and transient embolic or thrombotic phenomena. Emboli can occur in the absence of fibrillation and can be dissolved within minutes by thrombolytics in the circulating blood. The question of whether intimal lesions will cause spasm or whether prolonged spasm will cause ischemia followed by intimal lesions, remains open. Furthermore, collateral circulation does exist in certain cases at certain anatomical sites, and this may be the basis of rapid return of circulation.

Certain interesting points are made. One is the production of Reynaud's phenomenon by cryoglobulins. Another is the disproportionately high rise in the diastolic pressure of the central retinal artery in severe hypertension. A third is a warning about the confusion that can be caused in interpretation of the vascular appearance by edema of the retina itself. (8 figures, 135 references) Harry Horwich.

Wolter, J. R., Phillips, R. L. and Butler, R. G. **The star-figure of the macular area.** A.M.A. Arch. Ophth. 60:49-59, July, 1958.

In a histopathologic study of eyes of a patient with grade III hypertensive retinopathy, the star figure proved to be composed of fat-filled microglia (gitter cells), of free masses of lipids, and of hyalin. (14 figures, 8 references) G. S. Tyner.

12

OPTIC NERVE AND CHIASM

Darabos, G. **Septum canalis fasciculi optici.** Szemeszet 95:154-155, Dec., 1958.

The visual acuity of this 27-year-old woman was 1.0 on the right side and only 0.1 on the left. The right eye was intact. In the left fundus a pale optic disc was seen and the lamina cribrosa was visible as a translucent structure in the center, close to the vascular funnel. Normal visual fields were present on both sides except that the blind spot in the left eye was slightly enlarged. On the left side color vision was uncertain, even when the largest objects were shown. Tension was normal. Films taken of the left orbit by Rhese's technique showed that the optic canal was bipartite, as a result of a narrow horizontal bony plate in it. The contours were intact. This contraction gave rise to the atrophy of the left optic nerve.

Gyula Lugossy.

Donin, J. F. and Crowley, L. G. **Papilledema complicating retinitis pigmentosa.** A.M.A. Arch. Ophth. 59:609-611, April, 1958.

The occurrence of increased intracranial pressure in a patient with retinitis pigmentosa enabled the authors to observe papilledema limited to the central part of the optic nerve. This suggests that even in the presence of advanced visual field loss enough normal nerve structure remains to develop visible edema. (1 reference. E. J. Swets.

François, J. and Verriest, G. **Drusen of the papilla.** *Ophthalmologica* 136:289-325, Nov., 1958.

On the basis of a review of 300 cases, of which seven were their own, the authors describe the clinical manifestations of drusen of the optic disc. They divide drusen into three groups: 1. those associated with acquired disease of the nerve or eyeball, 2. those which are a manifestation of a heredodegenerative process such as pigment degeneration, and 3. idiopathic drusen. Those of group 3 are rarely visible before puberty and are unilateral in one fifth of the cases. Vision was reduced in one quarter of the subjects but blindness did not follow. But paracentral scotoma and fascicular defects as in chronic glaucoma were demonstrated. Heredity is dominant. (10 figures, 1 table, 110 references) F. H. Haessler.

Henderson, John W. **Optic neuropathy of exophthalmic goiter (Graves' disease).** *A.M.A. Arch. Ophth.* 59:471-480, April, 1958.

The blurring of vision often noted by patients with exophthalmic goiter may be attributed to refractive changes from increased pressure in the orbit, corneal changes from exposure or increased intraocular pressure, or occasionally from papilledema and the subsequent disturbance at the optic papilla. Some individuals develop disturbances of vision on the basis of intrinsic disorders in the optic nerve which are not visually demonstrated by ophthalmoscopic examination. The term "retrobulbar neuritis" usually appears in the literature to describe this type of lesion in endocrine exophthalmos. The author includes in his report of six cases a correlation with 10 other cases recently reported, so that a better understanding of the behavior of this complication of endocrine exophthalmos may be obtained. In the visual fields the usual finding is either central scotoma or nerve-fiber bundle defects. The clinical course is

similar to retrobulbar neuritis, and a majority of the patients regain useful vision. The status of the thyroid disease or its usual treatment have little effect on the course of the optic nerve difficulty. The term "optic neuropathy of exophthalmic goiter" is proposed to differentiate this disorder from retrobulbar neuritis, and several theories of possible causation are discussed. (6 figures, 1 table, 6 references)

E. J. Swets.

Klima, M., Petr, R., Steinhartova, L. and Rehak, S. **Surgical treatment of prechiasmatic neuritis complicated by incarceration of the intracanalicular segments of the optic nerves.** *Ophthalmologica* 136:161-174, Sept., 1958.

In a woman, 55 years of age, who had rapid deterioration of the central vision and the visual fields, inspection during surgery revealed edema of the intracanalicular, prechiasmatic and chiasmatic segments of both optic nerves. The changes were the result of a vasomotor disturbance ascribed to a tuberculotoxic injury. The authors believe that the majority of cases of so-called opticochiasmatic arachnoiditis are in reality a neuritis optica with a secondary arachnoid reaction. (4 figures, 12 references) F. H. Haessler.

Lasco, F. and Nicolesco, M. **The syndrome of excavation of the cribiform plate—pseudoglaucoma.** *Ophthalmologica* 136:90-98, Aug., 1958.

This syndrome has a various etiology: poisoning with methyl alcohol, sclerosis of the carotid arteries, temporal arteritis, general arterio-sclerosis with hypotension or hypertension, and intracranial or orbital tumors. Its development is favored by the histologic structure of the lamina cribrosa and is precipitated by vascular lesions and it develops slowly with atrophy of visual fibers and no proliferation of the intraocular neuroglia. (18 references) F. H. Haessler.

Mietke, Hans. **A rare ocular manifestation of sarcoidosis.** Klin. Monatsbl. f. Augenh. **133**:892-895, 1958.

A 60-year-old woman had a blind and painful eye. A papillitis was diagnosed on ophthalmoscopic examination. As a tumor could not be excluded the eye was enucleated. A granulomatous inflammation was found in the optic nerve. The uvea was not involved and the patient showed no other signs of sarcoidosis. (3 figures, 53 references)
Frederick C. Blodi.

Ormachea Iraizoz, J. **Indirect trauma to the optic nerve caused by an injury at athletic competition.** Arch. Soc. oftal. hispano-am. **18**:952-958, Sept., 1958.

A blow with a hockey ball on the frontointernal region of the right orbit caused a contusion of the globe with hyphema and retinal edema, a direct fracture on the lamina papyracea of the ethmoid bone, and an indirect fracture of the lower margin of the optic canal. The injury to the optic canal damaged the optic nerve. The final result was a degeneration of the inferior and superior macular fibers, with a corresponding scotoma. The author urges that in all cases of orbital trauma the optic canal should be examined roentgenographically in order to diagnose early reversible damage to the optic nerve. (4 figures)
Ray K. Daily.

Rehak, S., Bartousek, V. and Dubansky, B. **Vitamin B₁₂ in diseases of the optic nerve.** Ophthalmologica **135**:95-102, Feb., 1958.

The authors studied 19 patients of whom six got well, four were distinctly improved, seven showed objective improvement and two remained unchanged. They recommend daily doses of 100 to 250 γ of vitamin B₁₂. (1 table, 24 references)
F. H. Haessler.

Rosengren, Bengt. **Two cases of atrophy of the optic nerve after previous**

roentgen treatment of the chiasmal region and the optic nerves. Acta ophth. **36**:874-877, 1958.

Two cases are described where roentgen treatment of the hypophysis (for exophthalmus due to hyperfunction of the thyrotropic hormone) and of the eye (for tuberculous retinal disease) was followed by optic atrophy. While other factors of local or general nature may have been involved, it is not possible to exclude damage due to the roentgen treatment. (5 references)
John J. Stern.

Sasso, Bogomir. **Optic neuritis after varicella.** Ophthalmologica **136**:157-160, Sept., 1958.

Inflammation of the optic nerve (papillitis) occurred 10 days after varicella in a four and a half-year-old girl. Careful investigation revealed no other etiologic basis for the illness. After vitamin B₁₂, priscol, cortisone and chloramphenicol had been given for 12 days the child recovered completely. (1 figure, 10 references)
F. H. Haessler.

Varga, M. **Neuritis optici in childhood.** Szemeszet **95**:108-112, Sept., 1958.

The rare pattern of optic neuritis occurring in childhood is discussed on the basis of an interesting case. In a girl, aged eight years, bilateral optic neuritis occurred with headache after influenza. Examination revealed inflammation in the maxillary sinuses. Only a small quantity of mucus could be evacuated and the vision did not improve, though vitamins and foreign protein also were administered. One month later acute follicular tonsillitis occurred with high fever. After this, the vision became nearly normal. Only slight pallor of the discs remained and the visual fields were normal. Gyula Lugossy.

Wagener, Henry P. **Gliomas of the optic nerve.** Am. J. M. Sc. **237**:238-261, Feb., 1959.

The determination of the nature and extent of a primary tumor of the anterior visual pathways is difficult or impossible in many cases without an exploratory operation. Transfrontal craniotomy with removal of the roof of the orbit gives more information more readily than does an anterior orbital exploration. Also it affords more chance for complete removal of the tumor if its location makes it amenable to surgery. Most of the gliomas of the anterior visual pathways are low-grade astrocytomas. The prognosis is good if the tumor does not involve the chiasm and can, therefore, be removed completely. An astrocytoma of the chiasm presents a serious threat to vision and ultimately to life. Removal is often impossible and the effects of Roentgen therapy are uncertain. The weight of available evidence seems to support the contention that astrocytomas and oligodendrogliomas of the optic nerve and chiasm are in some way a part of the von Recklinghausen disease syndrome. (80 references)

Author's Summary.

Wertheimer, P., Rougier, J. and Wertheimer J. **Papilledema of unknown origin.** Bull. mém. Soc. franç. d'opht. 71:78-94, 1958.

Intracranial pseudo-tumoral hypertension with papilledema represents a well-known syndrome, characterized by headache, nausea, vertigo and papilledema and by the absence of other physical findings. The twelve patients discussed in this study all had bilateral papilledema and normal visual acuity. Their history was negative in respect to infectious diseases or trauma. The group included three children, seven women and three men. The ophthalmologic and X-ray findings, the EEG, ventriculography and arteriography are discussed. Surgery was performed in the three children and in one adult. The pitfalls in ophthalmologic differential

diagnosis with special consideration of congenital anomalies of the discs are described. The avoidance or errors in the etiologic diagnosis is considered to be the joint responsibility of the ophthalmologist and the neurosurgeon. Conservative treatment is indicated in the presence of papilledema and doubtful EEG when ventriculography does not give evidence of intracranial tumor. Alice R. Deutsch.

13

NEURO-OPHTHALMOLOGY

Amidei, Bruno. **Retraction nystagmus.** Riv. oto-neuro-oftal. 33:3-25, Jan.-Feb., 1958.

The author thoroughly discusses the so-called retraction nystagmus of Koerber. The clinical picture of this condition is characterized by protrusion and retraction movements of the eyeball which are usually accompanied by various forms of nystagmus and signs which are more or less typical of a supranuclear and nuclear oculomotor lesion. The author's review of the literature revealed that apparently only 25 cases of retraction nystagmus have been reported in the past 50 years. The case presented is that of a 9-year-old boy with acute disseminated encephalomyelitis. The ocular findings in this patient were paralysis of upward gaze, horizontal nystagmus, and retraction nystagmus. (7 figures, 44 references)

William C. Caccamise.

Bonnet, P. **Notes on the study of the syndrome of Claude Bernard. The action of the sympathetic system on the pupil.** Arch. d'opht. 18:129-147, March, 1958.

The author has considered in minute detail the many aspects of the syndrome of Claude Bernard. He describes the classical triad (miosis, enophthalmos, and reduction of the palpebral aperture) that indicates involvement of the sympathetic nervous system. He finds that explanation

of the cause of the clinical symptoms is not simple. The localization of the lesion may be extremely difficult. In some instances the syndrome can be symptomatic of a lesion not directly in the sympathetic pathway and at some distance from it. He concludes that there can be a reflex pathway and an actual reflex syndrome of Claude Bernard.

The article contains an anatomic study of the sympathetic system, a review of pertinent literature, and a discussion of the mode of action of the sympathetic fibers on the pupil. P. Thygeson.

Caselli, F. and Ponte, F. **The optico-chiasmatic syndrome and cisternographic study.** Riv. oto-neuro-oftal. 33:26-42, Jan.-Feb., 1958.

The authors present two cases of optico-chiasmatic syndrome, which demonstrate the importance of cisternographic study in the evaluation of such cases. (7 figures, 16 references).

William C. Caccamise.

Martelli, A. and Scassellati Sforzolini, G. **Encephalopathy of a fulminating and inflammatory nature with unusual clinical and anatomic-pathological manifestations.** Riv. oto-neuro-oftal. 33:57-71, Jan.-Feb., 1958.

The authors present the clinical and pathologic findings in a 38-year-old man with moderately increased intracranial pressure paresis of the left superior oblique muscle, paralysis of convergence, and nystagmus. Serial sections of the brain revealed marked edema in the cerebral stem region. The authors feel that this patient may represent a case of encephalitis lethargica. (8 figures, 17 references)

William C. Caccamise.

Sugawara, S. **Retrobulbar neuritis and multiple sclerosis.** Acta Soc. Ophth. Japan 62:2411-2422, Dec., 1958.

Sugawara reports five cases of enceph-

alomyelitis accompanied by retrobulbar neuritis. After a long-term study the disease was considered to be multiple sclerosis. He concludes that opticomyelitis and multiple sclerosis apparently differ clinically but many cases of encephalomyelitis might be multiple sclerosis pathologically. (5 figures, 30 references)

Yukihiko Mitsui.

Zanen, J. and Meunier, A. **Achromatic threshold of the fovea in multiple sclerosis.** Bull. mém. Soc. franç. d'opht. 71:95-113, 1958.

The achromatic and chromatic thresholds of central vision in persons with multiple sclerosis has been investigated by the authors in previous papers. The present study concerns 40 patients with multiple sclerosis. The techniques were the same as used in former research and the recording on the many charts was similar to that of earlier tables. The scales of interferential filters however have been completed only during the last year and they were used for the first time in this work. They apply to wave length, 423, 440, 468, 495, 515, 541, 569, 575, 591, 624, 643, 667, 698 and 724 millimicrons. Thorough and exact observations showed that the threshold in persons with central chorioretinitis and retrobulbar neuritis of various etiology were not essentially different and therefore could not be grouped separately. The authors also could not recognize a distinct disorder of the yellow-blue factor in chorioretinitis. At the same time they did not find the pronounced defect in the red-green element in diseases of the optic nerve, shown in analogous studies. Whenever there is an error in the recording of the pseudo-isochromatic tests without a marked elevation in the photochromatic interval as in the cases presented, the term pseudo-dyschromatopsia probably is more appropriate than dyschromatopsia. (13 figures, 6 references)

Alice R. Deutsch.

14

EYEBALL, ORBIT, SINUSES

Castellano, F. and Gemolotto, G. **Contribution to the surgical therapy of orbital tumors.** Arch. di ottal. 62:243-256, July-Aug., 1958.

This is a brief review and case report of a woman with an epithelial cylindroma of the left orbit. It was removed by a subdural Krönlein procedure. The bone was eroded and infiltrated. The final result was ptosis and a paralysis of the external rectus muscle, but the only alternative was exenteration. (7 figures, 25 references)

Paul W. Miles.

Esteban Aranguéz, M. and Gallego Tejedor, M. **A case of pulsating exophthalmos caused by a carotid-cavernous sinus aneurysm.** Arch. Soc. oftal. hispano-am. 18:297-304, April, 1958.

This is the third case reported by the author. A man, 21 years old, developed a pulsating exophthalmos of the right eye after a fracture of the frontal and maxillary bones in a car wreck. The diagnosis was made by angiography. After a compression test the external carotid artery was ligated. The exophthalmos was reduced, but did not recede completely. The diagnosis and therapy of this lesion are discussed. (5 figures) Ray K. Daily.

Gimenez Ruiz and Gimenez Guerra. **Hydatid cyst of the orbit.** Arch. Soc. oftal. hispano-am. 18:332-334, April, 1958.

A 40-year-old man was found to have an exophthalmos of the left eye, chemosis of the lower palpebral conjunctiva, a slight ectropion of the lower lid, and a hard formation on the floor of the orbit. Operation through an incision parallel to the inferior orbital margin revealed a large cyst which emptied itself during the surgical procedure. Five days after the operation the wound opened and a white membrane extruded. It was believed to be the capsule of the cyst that must have been removed

incompletely at the time of surgery. The cyst was found to have been developed from an egg of the *Tenia equinococcus*. The literature contains only about 120 such cases, gathered by the French Encyclopedia of Ophthalmology. (5 figures) Ray K. Daily.

Musial, Albin. **Severe endophthalmitis caused by a larva.** Klinika Oczna 28:215-218, 1958.

Severe endophthalmitis in a 15-year-old girl is described. The eye was enucleated and a larva found in the vitreous. The species of the insect was not determined. The author discusses the process of infection and epidemiology. (1 figure, 9 references) Sylvan Brandon.

Nagy, F. and Vathy, I. **Osteoma in the orbit.** Szemeszet 95:151-153, Dec., 1958.

In a woman, aged 19 years, there was a hard, hazelnut-sized structure below the inner and upper margin of the left orbit. On roentgen films an osteoma was seen in the left and right ethmoidal cells. Operation was carried out in local anesthesia, exposing the ethmoidal cells from without. The thinned lateral part of the nasal bone was chiseled off, then the tumor was easily luxated. Its site was the region of the bulla ethmoidalis. Between bone and tumor the only connection was a thin pedicle. Histologic study revealed osteoma eburneum pendulum. Gyula Lugossy.

Pelzer, R. H. and Garvin, W. **Controlled correction of diplopia and eye muscle imbalance in orbital and zygomatic fractures.** Am. J. Surg. 96:735-744, Dec., 1958.

The authors discuss in detail three patients who had orbital fracture and disturbance of ocular motility. Fractures of the orbital floor can occur without fractures of the orbital rim or the zygomatic compound. Surgery is best undertaken with the patient in local anesthesia. The authors advise the cooperation of an ophthalmologist to check the muscle func-

tion before, during and after the surgical operation. (11 figures, 35 references)

Irwin E. Gaynon.

Stucchi, C. and Delaloye, J. **Paraorbital lipophagic granuloma.** *Confin. Neurol.* **18**: 356-363, 1958.

The authors describe a case of para-orbital lipophagic granuloma in a woman 57 years of age. In this group of maladies all stages can be seen, from reticulo-endothelial granulomatosis to localized xanthomatosis. The disease has been ascribed to an enzymatic disturbance of metabolism of the reticular cells, abnormal trophic change, a vascular anomaly, and chemical necrosis. A traumatic origin of the localized liponecrosis could not be excluded. (3 figures, 24 references)

F. H. Haessler.

Vancea, P. and Lazarescu, D. **Orbital osteoma.** *Ophthalmologica* **136**:225-238, Oct., 1958.

The authors describe four cases of osteoma in the orbit, one of them in a year-old infant in whom a zone of calcification of the upper border of the left orbit and slight hyperostosis were noted after minimal cranial trauma. In advanced forms operation is necessary and the choice of procedure depends on the size and situation of the tumor. With early lesions it is better to await developments. (8 figures, 11 references)

F. H. Haessler.

Vergez, A. **The temporal approaches to the orbit.** *Arch. d'opht.* **18**:148-184, March, 1958.

The author discusses the various surgical approaches to the orbit including anterior orbitotomy, the transfrontal approach, and the temporal approach. He concludes that the temporal approach has been little used since its description by Dollinger in 1911, but that it merits further study and popularization. This approach is conservative and esthetically

good. The author then describes the surgical anatomy of the orbit and the adjacent temporal area, with particular reference to the motor and sensory nerves and vessels. He reviews the Krönlein procedure and other techniques, with the help of black and white illustrations. He then details the various aspects of the temporal approach, both favorable and unfavorable. Among the unfavorable features he mentions the occasional occurrence of a sudden cerebral edema and the fact that resection of the roof of the orbit and optic canal is sometimes limited by large frontal and ethmoidal sinuses. He concludes that the procedure lies well within the capability of the ophthalmologist who has had neurosurgical training. (2 figures)

P. Thygeson.

Zoltán, J. **A rare case in which the orbit and both lids were to be reconstructed simultaneously.** *Szemeszet* **95**:97-103, Sept., 1958.

The author gives a summary of the basic principles for treatment of neoplastic growth in the orbit and lids. In his patient, a man aged 21 years, an explosion had destroyed all soft parts of the left eye. Wound care consisted of the surgical removal of the remnants. Plastic reconstruction became possible after a long time. Eight operations were carried out, in the course of which the orbit and both lids were built up from an abdominal skin graft. It was a tube graft lined with skin of half thickness. Finally, the inner lining of the orbit was made up of abdominal skin; the skin of the lids was procured from free transplants. As a completion the eyebrow was replaced by means of an arterial graft.

Gyula Lugossy.

15

EYELIDS, LACRIMAL APPARATUS

Bernoulli, R. **The treatment of allergic affections of the lids.** *Ophthalmologica* **135**:110-114, Feb., 1958.

An ointment, Diphenamin Dispersa, is said to provide antiphlogistic and antipruriginous action. F. H. Haessler.

Converse, J. M. and Smith, B. **Repair of severe burn ectropion of the eyelids.** *Plast. & Reconstruct. Surg.* 23:21-26, Jan., 1959.

Surgical procedures for the repair of three deformities which occur in severe burn ectropion of the eyelids are described.

1. Forward displacement of the medial canthus is repaired by making a horizontal incision through the medial aspect of both upper and lower lids meeting at the angle. After the cicatricial tissue in this area has been removed, and the canthal angle resumes a satisfactory position, a free skin graft is applied by the epithelial outlay method. During the surgery, the puncta and canaliculi are protected with lacrymal probes in situ.

2. The transverse diminution of the palpebral fissure is increased with a medial canthoplasty, made with oblique incisions so that the flap can be lined with conjunctiva to expose the caruncle.

3. In loss of the eyelid margins in severe ectropion, tarsoconjunctival flaps are used to unite the upper and lower lid. The dissection of the lower lid is done along the plane between the skin and orbicularis oculi muscle fibers. The raw outer surface of the tarsal layer is covered with a split thickness graft maintained on a dental compound mold. Two months after this operation an incision is made through the tarsoconjunctival layer and skin to separate the upper and lower eyelids. (4 figures, 5 references) Alston Callahan.

Davies, G. B. and Wong, P. L. **Sclerosing lipo-granuloma in the orbit.** *Brit. J. Ophth.* 42:697-701, Nov., 1958.

A 16-year-old boy had a painless swelling in the left lower lid which might have appeared after a blow. A firm mass within the lid was easily felt and assumed to be

an unresolved hematoma. The mass persisted and increased and a biopsy revealed a sclerosing lipo-granuloma following traumatic fat necrosis. The tumor gradually subsided although it did not disappear entirely. (4 figures, 3 references)

Morris Kaplan.

Fazakas, S. **Contributions to the obstacles of conduction in lacrimal canaliculi.** *Szemeszet* 95:93-97, Sept., 1958.

The author has been concerned for many years with the morphology and functional disorders of the lacrimal pathways. He discusses among the obstacles to flow in the lacrimal canaliculi their direct and indirect stenoses, and the dislocation of the lacrimal point, and reports 12 cases of the congenital absence of the lacrimal punctum, and seven cases in which the lacrimal punctum and also the canaliculi were absent, four cases of papilloma of the lacrimal papilla, two cases of granuloma at the papilla, 12 cases of mycotic obstruction, and four cases in which the canalization of the initial part of the canaliculi did not take place. Therapy and results are discussed in detail, including the possibilities of repair. Further, the author describes his own method to find the place of obstruction, this being an indispensable factor of successful therapy.

Gyula Lugossy.

Majewski, Kazimierz W. **A case of unusually long eyelashes.** *Klinika Oczna* 28:121-124, 1958.

The author describes the unusually long eyelashes in a four-year-old child. They were 15 mm. long on the upper lid and 6 to 7 mm. on the lower. Eyelashes of one hundred persons were measured. The average length of upper eyelashes was 7.35 mm. and lower ones 4.88 mm. No difference in length was found between those of children and of adults. People with darker hair and skin have eyelashes which are longer by 1 mm. average than those of blonds. Sylvan Brandon.

Mazur-Sokolowska, Janina. **Tumors of the lacrimal sac.** *Klinika Oczna* 28:155-159, 1958.

Three cases of lacrimal sac tumors are presented. Lacrimation and bloody secretion were the first symptoms. On first examination tumors could be palpated and were later removed surgically. In one patient there was no recurrence after five years; in the other one recurrence was treated with X-ray with a good result. In the third patient recurrence required the removal of the maxillary bone. (1 figure, 5 references) Sylvan Brandon.

Montanelli, M. **Malignant tumors of the lacrimal sac.** *Boll. d'ocul.* 37:526-537, July, 1958.

The author briefly reviews the literature and presents a case of verified malignant epithelioma of the lacrimal sac which was extirpated. He stresses the need for early surgery in abnormalities of the lacrimal sac which might be due to a malignant tumor. (5 figures, 80 references)

Joseph E. Alfano.

Nagashima, Koji. **Studies on the function of the lacrimal pathways.** *Jap. J. Ophth.* 2:289-300, Oct.-Dec., 1958.

The tears are eliminated by an alternating peristaltic movement of the lacrimal sac and the canaliculi. Of the two, the canaliculi play the more important role. Horner's muscle constitutes a part of the palpebral fissure constrictor and the pumping action of the lacrimal sac occurs simultaneously with the movement of Horner's muscle. The pumping action of the canaliculus is impaired in chronic dacryocystitis. Dacryocystorhinostomy is the treatment of choice. (7 figures, 2 tables, 11 references) Irwin E. Gaynon.

Schenk, H. **The treatment of essential blepharospasm and spastic entropion with Rhaetocaine.** *Ophthalmologica* 135:103-110, Feb., 1958.

Ten patients with essential blepharo-

spasm were given repeated injections of Rhaetocaine; in three of them the spasm disappeared, in three there was marked improvement, and in four the treatment after a brief period of improvement was without success. In three patients with entropion a single injection was effective. The action of the drug is like that of alcohol but it is painless. (1 table, 34 references) F. H. Haessler.

Szmyt, Jacek. **Comparative study of tests for lacrimation.** *Klinika Oczna* 28:195-200, 1958.

The author describes tests used for measuring lacrimation and presents the results of his own investigation on 50 healthy young individuals. The amount of lacrimation depends on the degree of reflex stimulation. It is greatest in the first two minutes, it is reduced rapidly and is stabilized at a certain level after 10 minutes. Absorption tests are easy to do and quite reliable; colorimetric tests are reliable but much harder to use. In keratitis sicca stimulation of the nasal mucosa may help to determine the capacity of the lacrimal glands. Average secretion of tears in 24 hours at 20°C and in quiet air is about 1.22 gr; 25 percent of the secreted tears evaporate. (2 figures, 3 tables, 3 references) Sylvan Brandon.

16

TUMORS

Axt, Eva. **Neurofibromatosis and myopia.** *Klin. Monatsbl. f. Augenh.* 133:798-810, 1958.

A 13-year-old boy was observed who had neurofibromatosis of the skin and the left upper lid. He also had a bilateral myopia. His older sister was also myopic and had iris nodules of neurofibromatosis. It is suggested that myopia may be a manifestation of neurofibromatosis. (6 figures, 81 references) Frederick C. Blodi.

Blatt, N. and Ursu, A. **The invasion potential of malignant intraocular tumors.**

II. The resistance of the cornea. Arch. f. Ophth. 160:273-284, 1958.

A study of 22 histologic specimens, 16 of which were malignant melanomas, showed that the cornea, like the sclera, seems to be resistant to invasion. If tumor cells infiltrate, they follow the lamellar spaces and are accompanied by granulocytes. Degenerative changes are sometimes seen in the cornea when an intraocular tumor is present, even though there is no direct contact. (10 figures, 15 references) Edward U. Murphy.

Caballero del Castillo. **Melanosarcoma of the choroid.** Arch. Soc. oftal. hispano-am. 18:959-961, Sept., 1958.

In this case of melanosarcoma of the choroid, which was seen by the author in what he terms the preophthalmoscopic stage, the patient complained of visual impairment in the left eye when exploration of the fundus revealed only a slight elevation in the juxtamacular area. After a two-year period of observation a retinal detachment and a dark structure close to the papilla led to the diagnosis of the choroidal neoplasm. The diagnosis was confirmed histologically in the enucleated eye. (2 figures.) Ray K. Daily.

Cogan, D. G., Kuwabara, T. and Parke, D. **Epibulbar nevoxanthoendothelioma.** A.M.A. Arch. Ophth. 59:717-721, May, 1958.

Nevoxanthoendothelioma is a dermatologic and pathologic syndrome occurring almost exclusively in infants and children. It is characterized by histiocytic tumors in the skin and, occasionally, elsewhere. The tumors resemble the xanthomata of the Christian-Schüller syndrome, but the absence of associated symptoms make this diagnosis unlikely. The case presented in this paper is that of a five-year-old child with an epibulbar tumor which proved to be a nevoxanthoendothelioma. (6 figures, 6 references)

E. J. Swets.

Franceschetti, A., Marty, F. and Forgacs, J. **Xanthomatous tumors.** Confin. Neurol. 18:348-355, 1958.

Xanthomatous tumors are extremely rare. The authors describe their findings in one case in great detail and provide an adequate discussion of the problem. A great number of the tumors are cholesteatomas. (5 figures, 11 references)

F. H. Haessler.

Kennedy, R. J., Rummel, D., McCarthy, J. L. and Hazard, J. B. **Metastatic carcinoma of the retina.** A.M.A. Arch. Ophth. 60:12-18, July, 1958.

This case is reported because of the rarity of metastatic carcinoma in the retina alone. The tumor was histopathologically similar to the primary carcinoma of the rectosigmoid. (5 figures, 18 references)

G. S. Tyner.

Schepens, C. L. and Schwartz, A. **Intraocular tumors.** A.M.A. Arch. Ophth. 60:72-83, July, 1958.

A patient with bilateral choroidal hemangiomas is reported. Biopsy was successful in establishing the diagnosis. Diathermy was successful in preserving good vision in one eye. The tumor characteristically is pale pink or gray with little or no pigmentation. Dilated vessels may be seen and the overlying retina is frequently cystic and detached. (2 figures, 1 table, 52 references) G. S. Tyner.

Zeydler, Lucyna. **Treatment of orbital angiomas.** Klinika Oczna 28:203-208, 1958.

Surgical treatment of orbital angiomata is too traumatic and is fraught with many complications. X-ray treatment is considered the method of choice. In one of two cases X-rays were used with success; in the other radium was applied with good result after surgery had failed twice. There was no damage to the lens or skin. (3 figures, 9 references)

Sylvan Brandon.

17

INJURIES

Bulanda, Maria. **Self-inflicted injuries of the eye.** *Klinika Oczna* 28:159-163, 1958.

Self-inflicted injuries to the eyes are more common during times of war than in peace. The author describes three cases which resulted either in traumatic cataract or corneal scar. One patient was found to have schizophrenia and the other two were severe psychoneurotics. (10 references) Sylvan Brandon.

Gimenez Guerra. **A large intraocular foreign body in the left eye.** *Arch. Soc. oftal. hispano-am.* 18:335, April, 1958.

The loss of an eye from a double ocular perforation by a shot is reported. The foreign body was arrested in the vertex of the orbit from which it was extracted with great difficulty. (2 figures)

Ray K. Daily.

Juzwa, J. and Mazur, J. **Mechanism and the results of industrial injuries to the eyes.** *Klinika Oczna* 28:169-178, 1958.

Of 6,922 industrial eye injuries seen during one year 97.43 percent were light and 2.57 percent were severe. Of 179 severe injuries 27 ended in enucleation. In 67 cases there was complete recovery with 5/5 vision. Metal industry was the source of the greatest number of eye injuries, but machines like grinders, polishers or buffers also caused slight injuries. Chemical and wood industries had a relatively high percentage of severe injuries to the eyes. Protective goggles were worn by only 7.5 percent of workers. (3 tables, 6 references) Sylvan Brandon.

Marcks, K. M., Trevaskis, A. E. and Kicos, J. E. **Traumatic avulsion of the right cheek, eyelid, nose, and lip: case report.** *Plast. & Reconstruct. Surg.* 23:69-73, Jan., 1959.

A 17-year-old girl had her right cheek,

eyelids, right side of the nose, and lips amputated in an automobile accident. Both lids were torn free from the conjunctiva at its juncture with the inner tarsal borders, and a large portion of the cheek held the lip, nose, and eyelids together. The large sector of tissue was recovered and reappplied to the face. The nose was sutured in place, the different layers being sutured separately. The upper lip was trimmed of its muscle and fat and sutured to the mucous membranes as a full thickness graft. The eyelids were sutured back into their anatomic sites. Most of the grafted structure did not survive, except for the peripheral portions of the lip, the upper part of the nose and the medial aspect of both eyelids. A tube graft was developed on the right arm and used to resupply the tissue that sloughed away. (9 figures, 1 table)

Alston Callahan.

Schumacher, Heinz. **The action of coal dust on the eye.** *Ophthalmologica* 136:238-242, Oct., 1958.

Coal dust in contrast to quartz particles floats in the tears and forms small clumps which float onto the lid edge where they are easily removed. This special characteristic of coal dust accounts for the fact that coal dust is a very slight industrial hazard. (10 references)

F. H. Haessler.

Szrednicka-Chrzanowska, Krystyna. **Injury of the eye with methyl violet.** *Klinika Oczna* 28:165-168, 1958.

Methyl violet, which is present in indelible pencils, may be the cause of severe damage to the eye. The extent of damage depends on the location of the foreign body and the time it was in contact with the tissues. Treatment consists of removing the particle of pencil, excision of necrotic tissue and washing of the conjunctiva with peroxide. A transplant is used when necessary. A case is presented where a few particles of pencil stem re-

mained in the upper fornix for about 24 hours. The result was extensive necrosis of the conjunctiva followed by ulceration and perforation of the cornea. (11 references)⁶
 Sylvan Brandon.

18

SYSTEMIC DISEASE AND PARASITES

Colombi, C. and Gentili, R. **Fundus examination in coarctation of the isthmus of the aorta.** *Rassegna ital. d'ottal.* 27:321-328, Sept.-Oct., 1958.

With the advent of modern heart surgery the prognosis in patients with coarctation of the aorta is much improved. The author describes the retinal changes in 12 patients ranging in ages from 15 to 30 years. The caliber of the arteries was greatly diminished in 10 patients, the arteries were moderately tortuous in six, both arteries and veins were tortuous in one, serpentine pulsation was noted in 10 cases, there were minute intraretinal hemorrhages in five, and the central retinal pressure showed a minimum of 37 to 50 mm. in three cases and 60 to 80 in six. (1 table, 25 references)
 E. M. Blake.

D'Arrigo, Pasquale. **The ocular manifestations of rheumatoid disease in children.** *Arch. di ottal.* 62:391-413, Sept.-Oct., 1958.

Polyarthritis deformans causes ocular disease in 20 percent of cases. The syndrome attacks mesenchymal tissues in the joints and in the uvea. Band keratitis and cataract may follow. Two cases, in children aged 12 and 13 years, are reported. Diagnostic tests include an elevated sedimentation rate, which is positive in 85 percent of those not on steroid therapy. A very important test is serum agglutination with streptococcus hemolyticus group A. There is often dysproteinemia. (4 figures, 53 references)
 Paul W. Miles.

Gat, L. **Report about two-years' work done in the department of ophthalmology at the tuberculosis clinic at Debrecen.** *Ophthalmologica* 136:65-78, Aug., 1958.

The author summarizes the work done in the department of ophthalmology at the tuberculosis clinic at Debrecen during the first and second year of its existence. The occupancy of the 26 beds at the department's disposal was over 80 percent; two-thirds of the patients were greatly improved, one quarter improved, and less than five percent were unchanged during their stay. There are only four or five beds in each room. (3 tables, 14 references)
 F. H. Haessler.

Hollenhorst, R. W. and Stein, H. A. **Ocular signs and prognosis in subdural and subarachnoid bleeding in young children.** *A.M.A. Arch. Ophth.* 60:187-192, Aug., 1958.

This is a report from the Mayo Clinic of the ocular findings in 47 cases of subdural hematoma, subdural hygroma, and subarachnoid hemorrhage in infants and young children. There were pathologic findings in 60 percent of the cases. Eight of 23 patients who had abnormalities at the time of bleeding had permanent ocular defects. (4 tables, 17 references)
 G. S. Tynner.

Jensen, Vagn J. **Hydroa vacciniforme with ocular complications.** *Acta ophth.* 36:878-884, 1958.

Two cases are discussed in which hydroa vacciniforme was complicated by keratocyclitis and in one case by reduced lacrimal secretion. The ocular affection is considered to be of photogenic origin. (1 figure, 8 references)
 John J. Stern.

Levi, G. and Brewer, R. L. **Pseudoxanthoma elasticum, report of a case.** *Am. J. Med.* 26:157-160, Jan., 1959.

The authors describe their experience

with a patient who displayed the typical skin changes, fundus picture and vascular manifestations of the connective tissue dystrophy, pseudoxanthoma elasticum. (3 figures, 1 table, 17 references)

F. H. Haessler.

Pagani, Luciano. **Temporal arteritis.** *Rassegna ital. d'ottal.* 27:444-462, Nov.-Dec., 1958.

The diagnosis of this disease is often difficult, both from the clinical and from the histologic examination. Many authors consider the temporal arteritis as only a part of a generalized arterial disease. It may be part of a diffuse endarteritis, or a meso- or periarteritis. At times the picture is that of panarteritis of the nodosa form. Intense temporofacial pain is characteristic and constitutional symptoms are severe. Two cases are reported, one in a 77-year-old man who developed pain with inflammatory processes in the eyes ending in blindness. The second case was that of a 57-year-old farmer who developed intense painful crises which were induced by simple massage of the eyelids. Emphasis is laid on the removal of a section of the temporal artery involved. The study of the tissue removed in these cases is given in detail and with excellent photographs of the histologic preparations. (7 figures, 37 references) E. M. Blake.

Rodenhaeuser, Joe Henry. **Ocular changes in infantile leukemia treated with the modern leukemia therapy.** *Klin. Monatsbl. f. Augenh.* 133:811-821, 1958.

Two days before his death an eight-year-old boy with leukemia developed a hypopyon iritis in the right eye. On histologic examination microorganisms could be found in the anterior chamber. The same eye had had a large preretinal hemorrhage four weeks earlier. (5 figures, 13 references) Frederick C. Blodi.

Vellieux, M., Le Breton Oliveau, G. and Aubry, M. **African ocular onchocerciasis.** *Ophthalmologica* 136:190-203, Sept., 1958.

In the territory of Haute-Volta the authors made epidemiologic and clinical studies of the frequency and manifestation of onchocerciasis in 14,333 of 37,382 natives. They found carriers of cysts, degenerative changes in the anterior segment, degenerative chorioretinal changes, microfilaria in the anterior chamber and positive biologic reactions. (3 tables, 20 references) F. H. Haessler.

19

CONGENITAL DEFORMITIES, HEREDITY

Kyrileis, Werner. **Familial anisokoria.** *Klin. Monatsbl. f. Augenh.* 133:769-776, 1958.

Anisokoria may occur as an idiopathic phenomenon in otherwise normal patients. The incidence of this condition is difficult to determine. The difference in the diameters of the pupil may vary with the time of the day and may be absent during certain hours.

This idiopathic anisokoria may be hereditary. In the reported family, 23 out of 40 persons had anisokoria. The family tree covers three generations and anisokoria was transmitted as a dominant factor. The degree of anisokoria varied and was less marked during the day in sunlight. (1 figure, 8 references)

Frederick C. Blodi.

Urrets-Zavalía, A., Jr. and Jimenez, E. S. **Hereditary ciliary and superciliary hypotrichosis of a dominant character.** *Brit. J. Ophth.* 42:694-696, Nov., 1958.

Congenital lack of eyelashes and eyebrows is very rare and when it does occur is usually in association with other anomalies. A family is described in which this condition occurred in three generations.

Four siblings, a mother and a maternal grandmother had complete absence from birth of eyelashes and eyebrows though scalp hair was normal and no other appreciable irregularities were found. (1 figure, 13 references) Morris Kaplan.

20

HYGIENE, SOCIOLOGY, EDUCATION,
AND HISTORY

Bailliant, P. André Magitot (1877-1958). *Ann. d'ocul.* 191:793-799, Nov., 1958.

This article is in the nature of a eulogy to Magitot, who died in September, 1958. Bailliant reviews Magitot's family and ophthalmologic backgrounds. He mentions Magitot's contributions in glaucoma and as editor of the *Annales d'oculistique*. On the day of his death Magitot was hard at work on his last article on glaucoma.

David Shoch.

Belfort Mattos, R. **Visual acuity for distance and frequency of dyschromatopsia in Brazilian Indians.** *Arq. brasil. de oftal.* 21:106-255, 1958.

This comprehensive thesis summarizes the author's observations of the ocular changes in over 500 Brazilian Indians who were examined in various sections of that country during 1955 and 1956. This survey was made possible by the cooperation of governmental agencies who maintained friendly relations with most tribes and kept them supplied. Four linguistic groups were examined, quite primitive and free from miscegenation.

Since travel was difficult, only portable equipment was used in the various examinations which were made in the Indian villages. It was necessary to obtain cooperation of the head of the tribe who was usually more intelligent and therefore the first to be examined. Language barriers presented a problem, but were overcome as well as possible. No cycloplegics were used, nor was any tonometry done, be-

cause of the possible handicap to hunting and fishing resulting from the local medication. This made any refraction inaccurate.

Analysis of the data indicates that there is no significant difference in visual acuity between the two sexes. In comparing the visual acuity of civilized individuals with that of the Indians examined, the acuity for distance was greater in every case in the Indian. Not one case of dyschromatopsia was found.

In general, the palpebral fissure was narrower than in the white men, and epicanthus was observed more frequently. The iris was usually brown to very dark brown, and the fundus was always dark. There was a high percentage of conjunctival pigmentation.

Epilation of the brows and lashes seems to be fashionable among the uncivilized and is abandoned as the Indian becomes civilized. Pinguecula is common, and pterygium was found more commonly in one tribe exposed to considerable sun and wind.

Vascular retinopathy was conspicuously absent; the arterial pressure is low in the Indian. Strabismus was rare. Chorioretinitis was seen only four times.

Visual acuity below 20/200 was found 23 times and was due to a variety of causes—pterygium, leukoma, senile cataract, atrophy of the globe to mention a few.

The Brazilian Indian appears to have better visual acuity for distance than his civilized brother, and seems to have escaped hypertension and retinopathy, strabismus and dyschromatopsia. It is hoped that additional surveys can be made of these tribes before they have greater contact with civilization.

This remarkable thesis has many photographs, some in color, as well as tables, charts and references. (83 figures, 2 graphs, 6 maps, 27 tables, 29 references)

James W. Brennan.

Dubois-Poulsen, A. **The life and work of André Magitot.** *Ann. d'ocul.* 191:800-815, Nov., 1958.

Dubois-Poulsen emphasizes the experimental side of Magitot's life in ophthalmology. Magitot always used physiology to serve clinical ophthalmology and was at all times an investigator and innovator. He was one of the first to use lamellar grafts of the cornea and to investigate procedures for the preservation of grafts. Most of his life was devoted to the study of glaucoma and he was one of the first to make analyses of the aqueous humor in glaucoma and other diseases. He was a competitive author and speaker and, consequently, had many opponents. This led to some bitterness in his old age with some feeling that there was a lack of appreciation of his work. The author provides a brief biography of Magitot and states that the greatest influence in his life was that of Morax. After a severe cranial injury he began to devote more time to the *Annales d'oculistique* and world honors were shortly heaped upon him. In later years he had numerous collaborators, three of whom deserve special mention: Mawas, Bailliart, and Hartman. He will be sorely missed not only in France but by ophthalmologists throughout the world. David Shoch.

Halbron, Pierre. **André Magitot, editor in chief of Annales d'oculistique.** *Ann. d'ocul.* 191:820-822, Nov., 1958.

The author was an assistant to Magitot in editing the *Annales d'oculistique* and when Magitot became ill the responsibility for editing the Journal fell on Dr. Halbron. He describes Magitot's great interest in the *Annales*. He was as meticulous and exacting in the discharge of his obligations as he was in his practice and research work. David Shoch.

Jonkers, G. H. **Pathology in ophthalmic consulting rooms.** *Ophthalmologica* 135: 87-94, Feb., 1958.

The author based this study on data which he got by asking seven ophthalmologists for their findings in 3,700 private patients and 5,000 who were insured. The number of patients who came for distinctly minor complaints and in whom a serious disturbance was found is striking. (2 tables) F. H. Haessler.

Leplat, G. **Memoirs of contusions of the ocular globe.** *Ann. d'ocul.* 191:816-819, Nov., 1958.

The author discusses his association with Magitot. He reviews Magitot's long interest in glaucoma and points out that Magitot's original feeling was that glaucoma was a vascular disorder of the eye. One facet of this hypothesis involved the investigation of glaucoma following trauma to the globe. This work was done by the author and Magitot between 1920 and 1925. David Shoch.

Lindner, K. **A half century of trachoma study.** *Arch. f. Ophth.* 160:321-339, 1958.

The author reviews the progress of trachoma in the 50 years that have elapsed since Prowazek (whom Lindner knew and admired) described the inclusion body. The review is extensive and integrated in relation to several subheadings, namely: The naming of the inclusion bodies; The morphology of the inclusion bodies; The beginning of my own work; My contribution to the citation of the morphology; The bacterium *granulosis* Noguchi; The great progress in therapy; and The new research in the U.S.A. and Japan. (56 references)

F. H. Haessler.

Pascucci, I. **Some considerations about the government institution, "Opera Nazionale for Civil Blindness," and the principal causes of blindness seen during a visit there.** *Arch. di ottal.* 62:269-286, July-Aug., 1958.

In this long review of the public health

aspects of blindness, the author provides valuable statistics on more than 15,000 cases. The cases are classified in terms of etiology; 26 percent were congenital and 74 percent acquired. Of the congenital, the largest group were cases of myopia. The proportion of other diseases seemed reasonable, but the absence of cases of retrolental fibroplasia was noted. Nine percent of the acquired blindness was the result of chronic simple glaucoma.

Paul W. Miles.

Redslob, E. **Magitot and glaucoma.** *Ann. d'ocul.* 191:823-842, Nov., 1958.

The author first met Magitot 35 years ago when he had already expressed an interest in glaucoma. Magitot investigated his subject under the following headings: normal ocular tension, the anterior chamber, pathologic tension, optic nerve atrophy, the visual field, and therapy. In regard to normal ocular tension his chief field of interest was the presence of a cerebral center for ophthalmotonus. Magitot felt that drainage of the aqueous humor through vascular changes of the eye was as important as the drainage through Schlemm's canal. He also believed that the optic nerve atrophy seen in

glaucoma was not due simply to the increased intraocular pressure, but was a vascular disease of the nerve which was part of the whole syndrome of glaucoma. As a consequence of this he felt that local treatment of the glaucoma with miotics did not affect the disease of the optic nerve. The treatment for this aspect of glaucoma was of necessity treatment of the whole body. (28 references)

David Shoch.

Smialowski, A. and Vaile, S. **Composite mounting of thirty-five millimeter color transparencies.** *A.M.A. Arch. Ophth.* 60:321-323, Aug., 1958.

The method is described. (7 photographic figures) G. S. Tyner.

Wheeler, M. C. **Punch cards for motility records.** *A.M.A. Arch. Ophth.* 59:603-606, April, 1958.

A preliminary report of the use of punch cards for motility records is presented. A great deal of effort was involved in devising of these cards, and the author feels that the reporting of his experience might aid others who are interested in this method of recording. (5 figures)

E. J. Swets.

NEWS ITEMS

EDITED BY DONALD J. LYLE, M.D.
411 Oak Street, Cincinnati 19, Ohio

News items should reach the editor by the 10th of the month. For adequate publicity, notice of postgraduate courses and meetings should be received three months in advance.

DEATH

Dr. Paul William Renken, New Orleans, Louisiana, died November 22, 1958, aged 51 years.

ANNOUNCEMENTS

SECTION ON OPHTHALMOLOGY, A.M.A.

The Section on Ophthalmology, American Medical Association, will meet Wednesday morning, June 10th, Thursday morning, June 11th, and Friday morning, June 12th, at the Ambassador Hotel, Atlantic City.

The program for the first session includes: "Clinical aspects of ocular siderosis and hemosiderosis," Paul A. Cibis, Tsuyoshi Yamashita, Francisco Rodriguez, St. Louis, with the discussion to be opened by Lorenz E. Zimmerman, Washington, D.C.; "Ocular manifestations of the chronic renal tubular insufficiency syndromes," Harold F. Falls, Ann Arbor; discussion to be opened by Isaac S. Tassman, Philadelphia; "Clinical study of choroidal nevi," Edward Tamler, San Francisco, and A. Edward Maumenee, Baltimore, discussion to be opened by Joseph A. C. Wadsworth, New York; "Embryonal rhabdomyosarcoma of the orbit in children and young adults," William C. Frayer and Horatio T. Enterline, Philadelphia, discussion to be opened by Wilfred E. Fry, Philadelphia; "Mycotic ulcerative keratitis," Shaler Roberts, Caesar Gonzalez, Ernest Chick, and Banks Anderson, Durham, North Carolina, discussion to be opened by Frank W. Newell, Chicago; "Applanation tonometry in the diagnosis and treatment of glaucoma," Andrew J. Gay and Bernard Becker, St. Louis, discussion to be opened by Peter C. Kronfeld, Chicago; "The application of the television ophthalmoscope to some problems of clinical ophthalmology," A. M. Potts, S. S. West, and J. Shearer, Cleveland, discussion to be opened by Arthur Linksz, New York; "The effect of alpha-chymotrypsin on the rabbit zonule and lens capsule," Robert H. Bedrossian, Vancouver, Washington, discussion to be opened by Richard C. Troutman, New York.

On Thursday, June 11th, the executive session will precede the following program: "Clinical aspects of uveal hypersensitivity," Robert S. Coles and Frederick H. Theodore, New York; "Long-term steroid therapy of chronic uveitis," Dan M. Gordon, New York, discussion to be opened by Irving H. Leopold, Philadelphia; "Effect of levo-rotary adrenalin (two percent) on the glaucomatous eye," Lawrence L. Garner, Milwaukee, William Johnstone, Chicago, Elmer J. Ballintine, Cleveland, and

Michael Carroll, Chicago, discussion to be opened by Willis S. Knighton, New York; "Results of iridencleisis in Negro and white races," John R. Cassady, South Bend, Indiana, discussion to be opened by Samuel D. McPherson, Jr., Durham, North Carolina.

"Ocular manifestations of pituitary tumor in Cushing's syndrome," Thomas P. Kearns, Robert M. Salassa, Collin S. MacCarty, and James W. Kernohan, Rochester, Minnesota, discussion to be opened by Francis Heed Adler, Philadelphia; "Conjunctivo-antro-rhinostomy," James E. Bennett, James R. Armstrong, Raymond E. Jones and Fillmore Schiller, Cleveland, discussion to be opened by Edmund B. Spaeth, Philadelphia.

On Friday, June 12th the program will be a "Panel on neuro-ophthalmology," opened by the address of the chairman, Frank B. Walsh, Baltimore, and followed by the address of the invited foreign guest, S. P. Meadows, London. Then will be read these papers:

"Ocular manifestations of tumors of the brain stem," Paul C. Bucy, guest of honor, Chicago, and James E. Keplinger, Chicago; "Ophthalmologic involvement in the primary demyelinating diseases," Donald J. Lyle, Cincinnati; "Some neuro-ophthalmologic considerations in cerebral vascular insufficiencies," William F. Hoyt, San Francisco; "Bilateral central scotomas of hysterical origin," Harvey A. Lincoff, New York; "See-saw nystagmus with suprasellar epidermoid tumor," J. Lawton Smith and Vernon H. Mark, Boston; "Supratentorial mass lesions presenting with brain stem signs," Edward W. D. Norton, Miami; "Macular visual fields," Charles J. Campbell and M. Catherine Rittler, New York; "Convergence nystagmus," David G. Cogan. In closing the panel will be discussed by S. P. Meadows, Paul C. Bucy, and Frank B. Walsh.

On June 11th, from 5:30 to 7:00 P.M. there will be a "Dutch-treat" cocktail party in the Renaissance Room at the Ambassador Hotel to meet the chairman of section, Dr. Frank B. Walsh, and the guests of honor, Dr. S. P. Meadows and Dr. Paul C. Bucy. All physicians attending the section meeting and their wives are invited.

SYMPOSIUM ON RECENT DEVELOPMENTS IN RESEARCH

The ninth annual instrument symposium and research equipment exhibit will be held September 28 through October 1, 1959, at the National Institutes of Health, Bethesda, Maryland.

Sponsors of the exhibit are the nation's leading

instrument manufacturers, who will display the newest developments in laboratory glassware and electronic, surgical, radiation, optical gas-sampling, and other research equipment.

Sponsors of the symposium are the Washington, D.C., sections of the American Association of Clinical Chemists, American Chemical Society, Instrument Society of America, Professional Group on Medical Electronics of the Institute of Radio Engineers, Society of American Bacteriologists, and the Society for Experimental Biology and Medicine.

For additional information about the symposium and exhibit, write or call James B. Davis, National Institutes of Health, Public Health Service, Bethesda 14, Maryland. Phone: OLiver 6-4000, extension 2315.

COURSE ON PERIMETRY

A course in practical perimetry for office assistants will be presented at the Ohio State University by the Department of Ophthalmology July 13th, 14th, and 15th. The following schedule will be presented in the Ohio State University Student Union Building, located at High and 13th Streets: July 13th: Demonstration of instruments, chart forms and recording technique, demonstration and practice recording of isopters, blindspot description, examination, and recording scotomas, introduction to general perimetric principles, and practice in technique under supervision.

July 14th: Glaucoma and its perimetric characteristics, practice measurements and recording of glaucoma fields, chorioretinitis and its perimetric characteristics, practice measurements and recording of chorioretinitis fields, anatomy of the visual pathways, brain diseases and their perimetric characteristics, and practice measurements and recording of fields in brain disease.

July 15th: Hysteria and its perimetric characteristics, practice measurements and recording of hysterical fields, Harrington screener, the importance of reliability, pitfalls and problems, and questions and answers.

This course is designed to be understandable to an intelligent person with no previous perimetric experience. Registration is limited to individuals sponsored by an ophthalmologist. Registration is limited and after July 1st will be accepted only if space remains available. Applications will be validated by receipt of a \$25.00 check made payable to the Department of Ophthalmology. A full refund will be made if the applicant is unable to attend the course. For further information write Dr. William H. Havener, Department of Ophthalmology, Ohio State University, Columbia 10, Ohio.

ORTHOTIC EXAMINATIONS

The annual examination of orthotic technicians by the American Orthotic Council will be conducted in August and October, 1959.

The written examination will be nonassembled and will take place on Thursday, August 20th, in certain assigned cities, and will be proctored by designated ophthalmologists.

The oral and practical examinations will be on Saturday, October 10th, in Chicago just preceding the meeting of the American Academy of Ophthalmology and Otolaryngology.

Application for examination will be received by the office of the Chairman of Examination, Frank D. Costenbader, M.D., 1605 22nd Street, N.W., Washington 8, D.C., and must be accompanied by the examination fee of \$30.00. Applications will not be accepted after July 1, 1959.

MISCELLANEOUS

ORDER OF ST. JOHN

Sir Stewart Duke-Elder, the hospitalier, and Lieut. Gen. Sir Henry Pownall, the chancellor, Order of St. John, laid two foundation stones of the Order's new ophthalmic hospital in Jerusalem, one inscribed in Arabic, the other in English. Already finished are the warden's house and the nurses' quarters. The main hospital has been scheduled for completion by early autumn.

SLITLAMP BIOMICROSCOPY AND OCULAR SURGERY

The Committee on Post-graduate Education of the Montefiore Hospital, Pittsburgh, sponsored an advanced course in slitlamp biomicroscopy of the living eye combined with additional courses in slitlamp microscopy, gonioscopy, deep vitreous and retinal biomicroscopy, applanation tonometry, surgery of intraocular foreign bodies, and cataract surgery, at the Montefiore Department of Ophthalmology under the direction of Dr. Harvey E. Thorpe and associates, May 4th to 7th. Members of the guest faculty were: Dr. Robert J. Masters, Indianapolis, and Lee Allen, Iowa City, Iowa.

RESEARCH GRANT

The Seeing Eye, following its recent program to aid other agencies whose efforts in the prevention of blindness have been proved, recently made a grant of \$25,000.00 for the partial support of a research project on "Uveitis: Etiology, diagnosis, and treatment," sponsored by the Institute of Ophthalmology of The Columbia-Presbyterian Medical Center in New York.

The research in uveitis, which causes about 10 percent of all blindness, will be initiated under the supervision of Dr. John H. Dunnington, director of the Institute and professor and chairman of the Department of Ophthalmology, Columbia University Faculty of Medicine. Upon Dr. Dunnington's retirement in June, Dr. A. Gerard DeVoe, incoming director of the Institute, will supervise continuation of the project.

The Institute of Ophthalmology at The Columbia Presbyterian Medical Center was opened in 1933 and presently maintains 92 beds exclusively for eye patients. In addition to nine residents in training, 30 ophthalmologists, all faculty members in the College of Physicians and Surgeons.

MADRID COURSE

At the opening session of a postgraduate course sponsored by the Madrid Ophthalmological Society,

under the presidency of the Inspector General of Health, Dr. Pastor, and direction of Dr. Garcia Orcoyo and Dr. Perez Llorca, the regular minutes of the secretary and treasurer were read by Dr. Del Rio Cabañas and the inaugural address "Cajal in ophthalmology" was splendidly given by Dr. D. Florentino Mallol de la Riva.

Next came a report on awards: Dr. D. Mario Esteban de Antonio, the Nicolich prize, for his work "The pharmacology of local ophthalmic therapy"; the Cottet prize to Dr. D. Fermin Galindez Iglesias; the eye prize of 5000 pesetas divided between Dr. Moreno Canovas, Dr. Crespi, Jr., Dr. Moreno Cadierno, Dr. Lorenzo, Dr. Limenez, Dr. Amaya y villen de Castro. The Geve prize to Dr. Alonso y Riaza and the prize of the society to Dr. Menendez Vallejo and Dr. Sonsalve Aguillar. The prizes of the Board of Health were awarded to Ulloa and Juste.

The president, Dr. Marin-Amat thanked the members of the society for the fine scientific work done during the last course, also to the health department director and those organizations who generously contributed prizes to the society in recognition of outstanding achievement.

SOCIETIES

AMERICAN OPHTHALMOLOGICAL SOCIETY

On the program for the 95th annual meeting of the American Ophthalmological Society which will be held at the Homestead, Hot Springs, Virginia, Thursday, Friday, and Saturday, May 28th, 29th, and 30th, will be:

"Panum's areas and some other prevailing misconceptions concerning binocular vision," F. H. Verhoeff, Boston; "Ophthalmoscopically visible small spots in the ocular fundus," Arthur J. Bedell, Albany, New York; "Atypical limbal vernal conjunctivitis," Ludwig von Sallmann and David Paton, Bethesda, Maryland; "Some systemic effects of local anticholinesterase agents," Irving H. Leopold, Narendra Krishna, and Robert A. Lehman, Philadelphia.

"The pathogenesis of paralysis of the third cranial nerve," C. Wilbur Rucker, William P. Keefe, and James W. Kernohan, Rochester, Minnesota; "Intra-scleral drainage channels: Normal rabbit eye," L. Benjamin Sheppard, Richmond, Virginia; "Retinal dehydrogenases," David G. Cogan and Toichiro Kuwabara, Boston; "Experiences with light coagulation of fundus lesions," DuPont Guerry, III, and H. Wiesinger, Richmond, Virginia.

"The influence of the sympathetic nervous system on the electrical potentials of the extraocular muscles," Frederick C. Blodi and Maurice W. Van Allen, Iowa City; "Long-term preservation of donor tissue for corneal grafting," Frederick W. Stocker, et al., Durham, North Carolina; "Ocular complications of trans-sphenoidal hypophyseal destruction with radioactive yttrium," Frank W. Newell and William M. S. Ironside, Chicago; "Hemangioma of the choroid," Angus L. MacLean and A. Edward Maumenee, Baltimore.

"Expulsive subchoroidal hemorrhage associated with cataract extraction: Report of a case with survival of the eye," John W. Henderson, Rochester, Minnesota; "Cinematography of human retinal vessels," Kenneth C. Swan and Paul Bailey, Jr., Portland, Oregon; "Experience with the Barraquer method of extracting the dislocated lens," F. Phinizz Calhoun, Jr., and William S. Hagley, Atlanta, Georgia; "Completely dislocated hypermature cataract and glaucoma," Paul A. Chandler, Boston.

"Chymotrypsin for zonulysis in cataract surgery," Harvey E. Thorpe, Pittsburgh; "Report of ocular features of a case of acute disseminated histiocytosis (Letterer-Siwe)," Parker Heath, Sullivan Harbor, Maine; "Severe exophthalmos associated with malignant lymphoma," James N. Greear, Jr., and Charles D. Lanning, Reno, Nevada; "The probable role of benign systemic histoplasmosis in the etiology of granulomatous uveitis," Alan C. Woods and Henry E. Wahlen, Baltimore; "The use of amphotericin B in selected cases of chorioretinitis," Harold F. Falls, Ann Arbor, Michigan.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM

Opening the recent meeting of the Ophthalmological Society of the United Kingdom, the president, R. C. Davenport, followed his address of welcome with his presidential address on "Facets of glaucoma." Other papers on the three-day program were:

"The use of miotics in convergent squint," R. W. Stephenson; "The rate of aqueous flow and the adrenals," Erik Linner; "The significance of the George Young threshold test," Frank W. Law; "The surgical treatment of persistent vernal catarrh," A. G. Cross; "Early surgical treatment of injuries of the eyelids," H. B. Stallard; "Some aspects of congenital glaucoma," Arthur Lister; "Plastic repair of cicatricial ectropion by free transplantation," F. Papolczy; "The organization of ophthalmic outpatient departments and their design for convenient working," J. D. Welch; "The removal of the corneal disc from the host in keratoplasty," Dermot Pierce; "Survey of 100 penetrating corneal grafts," Derek Ainslie; "Physiologic alterations in the intraocular pressure," W. E. S. Bain; "Diagnosis of secondary detachment," L. G. Fison; "The ontogeny and phylogeny of visual artistry," P. D. Trevor-Roper; "A study of the effect of citral and vitamin A on glaucoma," F. C. Rodger.

In addition there was a symposium on "The treatment of ocular injuries," openers; John Whitwell, M. J. Roper-Hall, and Giles J. Romanes, and a discussion on "The swollen optic disc," openers: D. P. Greaves, S. P. Meadows, and C. A. Cook. Several films were shown: "Cataract extraction with chymotrypsin," Dermot Pierce; "The use of alpha-chymotrypsin in cataract surgery," G. B. Kara; "The correction of uniocular aphakia with anterior chamber acrylic implants," D. P. Choyce; "Ocular inflammations," Pfizer, Ltd.

MASSACHUSETTS EYE AND EAR MEETING

On the first program for the ophthalmological section of the annual meeting of the Massachusetts Eye and Ear Alumni Association held recently in Boston with the 449th meeting of the New England Ophthalmological Society were: Leona Zacharias, "Retrolental fibroplasia during the past five years"; Albert E. Sloane, "Office management of low vision cases"; Charles L. Schepens, "Complications of retinal detachment surgery"; Francis A. L'Esperance, Jr., "Greater image magnification in indirect ophthalmoscopy"; Garrett L. Sullivan, "Some experiences with epithelization of the anterior chamber"; William Stone, Jr., "Automatic release for erisophake"; Charles Snyder, "T. R."; J. Lawton Smith, "Neuro-ophthalmology conference." Dr. Algernon B. Reese of New York presented the annual Howe Lecture, his subject being "The melanoma problem." Dr. Reese also spoke on "Some frontiers in ophthalmology."

At the second session of the ophthalmological section, the following program was presented by the alumni association: "An individual technique of intracapsular cataract extraction," Hugh C. Donahue; "Progress report on aqueous outflow," W. Morton Grant; "Encephalocele of the orbit of a newborn infant," Marvin Posner; "Prognosis of temporal arteritis," Henry A. Mosher; "Late report on vitreous face contacts," Brendan D. Leahey; "The eyes of twins," David D. Donaldson; "Operations of blepharoptosis and epicanthus," Carl C. Johnson.

"Recent advances in aseptic technique," Henry F. Allen; "Fungus infections of the cornea," W. Banks Anderson; "Retinal dehydrogenases," David G. Cogan; "The present concept of the structure of the vitreous body," Endre Balazs; "Observations on choroidal detachment and cyclodialysis," Paul A. Chandler; "Radioactive phosphorus and tumors," George Olive; "Discussion of secondary postenucleation implantation and other secondary procedures," William Stone, Jr.

GILL MEETING

The Gill Memorial Eye, Ear and Throat Hospital has just completed its 32nd annual spring congress

in ophthalmology and otolaryngology and allied specialties, with an attendance of 350 physicians and their wives. There were 42 states, England, Canada, and several foreign countries represented. There were 21 guest speakers present. Sixty lectures and closed-circuit televised surgery made up the five and one-half-day program of the spring congress. In 1960, the 33rd congress will be held from April 4th through April 9th.

PERSONALS

Dr. Frank D. Costenbader, Washington, D.C., and Dr. Irving H. Leopold, Philadelphia, were guest speakers at the recent meeting of the Dallas Southern Clinical Society.

Dr. James E. Lebensohn, Chicago, has been invited by Professor Michaelson, chief of the Eye Department, Hadassah University, Jerusalem, to present at that institution a series of lectures on clinical optics.

Dr. Lorenz E. Zimmerman, chief of the Ophthalmic Pathology Section of the Armed Forces Institute of Pathology, recently presented lectures in Houston and Galveston, Texas, and at the University of California at Los Angeles. He also participated in a meeting of the Sensory Diseases Study Section in Berkeley, California.

Dr. Albert E. Sloane, Boston, recently established a Low Vision Clinic in the Eye Department of the Mayer de Rothschild-Hadassah University Hospital in Jerusalem.

Prof. Paula Santos of the Catholic University of São Paulo, gave the inaugural class for the 1959 course of ophthalmology at the Escola Paulista de Medicina, São Paulo, Brazil.

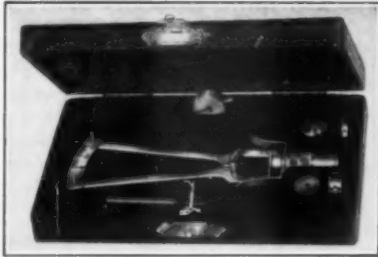
Prof. Moacyr E. Alvaro gave the inaugural class of the First Graduate Course in Ophthalmology given by the Medical School of the University of Minas Geraes, in Belo Horizonte, Brazil.

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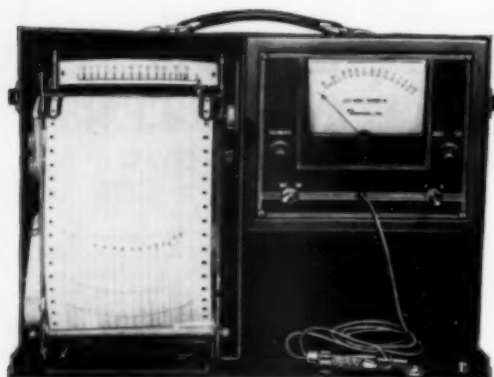
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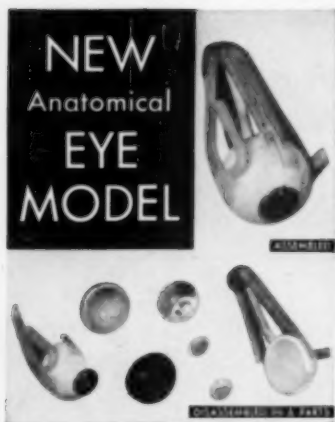
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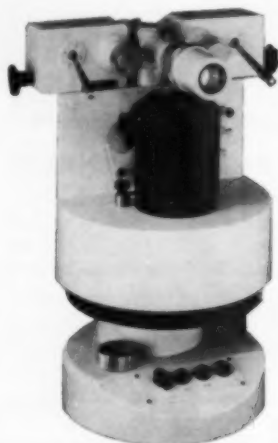
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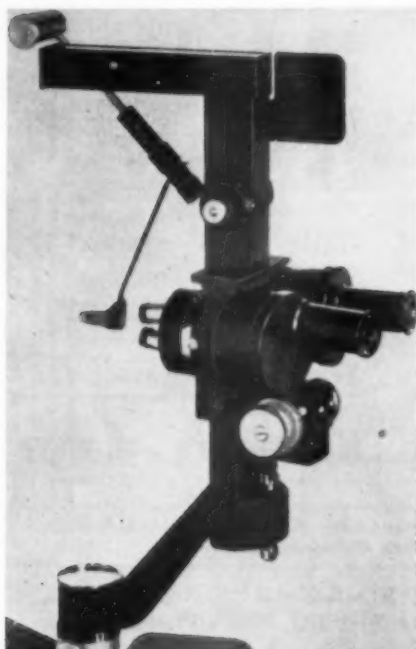
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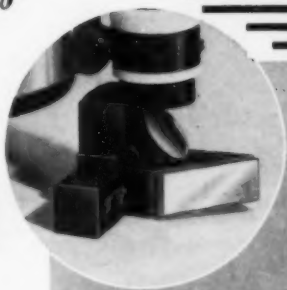
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